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ABSTRACT

This proceedings volume contains a total of 39 papers. The following 28 selected titles are cited as those most clearly relevant to education: "A National Study of Teacher Educators and State Supervisors in Agricultural Education" (Foster, Horner); "A Profile of the Effective Vocational Agriculture Teacher" (Rheault, Miller); "Analysis of Needs: Educational Programs for Young and Adult Farmers" (Martin); "Anxieties of Agricultural Education Majors Prior to and Immediately Following the Student Teaching Experience" (Foster); "Assessing Needs and Planning Inservice Education for First-Year Vocational Agriculture Teachers" (Barrick, Powell); "Assessment of the Use of Microcomputers in North Dakota Secondary Vocational Agriculture Departments" (Zidon, Luft); "Attitudes Held by Vocational Agriculture Teachers towards FFA Proficiency Awards" (Kotrlik); "Dinosaurs and Vocational Agriculture: A Historical Analysis of the Curriculum in Vocational Agriculture" (Moore, Borne); "Educational Reform: The Influence of Enrollment in Vocational Agriculture on Admission to a College of Agriculture" (Newman, Warmbrod); "Effects of the Problem Solving Approach on Achievement, Retention, and Attitudes of Vocational Agriculture Students in Illinois" (Flowers, Osborne); "Factors Affecting Practical Agricultrual Training Experiences for Graduate Students from Developing Countries" (Steele); "Factors Affecting the Diffusion/Use of an On-Line Database System (AGRIDATA) for Instruction in Vocational Agriculture Programs in New York State" (Sutphin, Berkey); "Factors Associated with Adjusting Vocational Agriculture Programs as Perceived by Teachers" (Birkenholz, Stewart); "Factors Related to the Career Decisions of Seniors Who Have Taken Vocational Agriculture" (Kotrlik et al.); "Impact of Beginning Teaching Supervision on Vocational Agriculture Teacher Performance" (Waters, Yoder); "Indicators of Quality Used for Faculty Selection in Departments of

Agricultural Education" (Deeds); "Occupational Aspirations of Third-Year Vocational Agriculture Students" (Burnett, Venable); "Perceived Retraining and Upgrading Needs of Managers in Five Selected North Dakota Agribusiness Industries" (Olschlager, Priebe); "Perceptions of Vocational Agriculture Subject Matter Areas" (Dillon); "Perceptions Regarding Planning and Educating for Diversified Agricultural Production in Iowa" (Martin); "Personality Types of 500 Farm Couples--Implications for Agricultural Educators during Critical Economic Conditions" (Horner, Barrett); "Relationships of Student Perceptions of Classroom Learning Environment Factors" (Harper et al.); "Student Misbehavior and Job Satisfaction of Vocational Agriculture Teachers" (Camp); "Teaching Agricultural Mechanics Using Simulation" (Agnew, Shinn); "The Cooperative Relationship between Vocational Agriculture Teachers and Extension Agents" (Schroeder, Moss); "The Impact of the Vocational Education Act of 1963 on Agricultural Education" (Crawford, Cooper); "The Personal, Educational, and Occupational Benefits Received by Participants in the National FFA Contests" (Gamble); and "Vocational Agriculture for the Year 2000" (Kotrlik). Critiques follow 36 of the papers. (YLB)

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RESEARCH IN
AGRICULTURAL EDUCATION

SEEKING SOLUTIONS FOR TOMORROW'S CHALLENGES

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PROCEEDINGS OF THE THIRTEENTH ANNUAL NATIONAL AGRICULTURAL EDUCATION RESEARCH MEETING

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FOREWORD

The National Agricultural Education Research Meeting (NAERM) is dedicated to research and featuring the best studies in agricultural education from across the nation. The 1986 NAERM is the thirteenth meeting in a series of distinguished meetings. Previous meetings were:

Number	Year	Location	Name of Institution of Chairperson
1	1974	New Orleans, LA	Hollie Thomas, Florida State
2	1975	Anaheim, CA	Hollie Thomas, Florida State
3	1976	Houston, TX	Glen Shinn, Mississippi State
4	1977	Atlantic City, NJ	William Richardson, Purdue
5	1978	Dallas, TX	Bennie Byler, Mississippi State
6	1979	Anaheim, CA	Ronald Brown, Mississippi State
7	1980	New Orleans, LA	L. H. Newcomb, Ohio State
8	1981	Atlanta, GA	Maynard Iverson, North Carolina State
9	1982	St. Louis, MO	Dale Oliver, VPI&SU
10	1983	Anaheim, CA	Paul R. Vaughn, New Mexico State
11	1984	New Orleans, LA	Jimmy G. Cheek, University of Florida
12	1985	Atlanta, GA	Bob Stewart, University of Missouri

The expectation of quality for the 1986 NAERM was established by those who conducted the previous meetings. I am grateful to a number of individuals who helped make this year's meeting successful: to Robert Stewart, 1985 NAERM Chairman, who provided an outstanding example to follow: to Jerry Peters, Chairperson and to the members of the AVA/AED Reserach Committee for sponsoring and assisting in conducting the meeting; to the Conference Secretary, Leon Schumacher, who organized the conference registration; to Gary Briers and Joe Townsend, Program Chairpersons, AVA/AED, who coordinated the overall program planning; to the participants in the program--chairpersons, facilitators, discussants and speakers--whose efforts resulted in an excellent conference; and to all members of the profession who submitted proposals and permitted their work to be judged by their peers.

A special word of thanks is due the following individuals who served as referees and whose work provided the basis for the objective selection of presenters.

Al Mannebach, University of Connecticut
W. Wade Miller, Iowa State University
Robert Birkenholz, University of Missouri
Lloyd Bell, University of Nebraska
James Knight, Ohio State University
R. Lee Cole, Oregon State University
Richard I. Carter, Iowa State University
Lonell Moeller, South Dakota State University
Vernon Luft, North Dakota State University
William Hull, Ohio State University
Norval McCaslin, Ohio State University
Joe Kotrlik, Louisiana State University
Marvin Cepica, Texas Tech University
Jeffrey Moss, Louisiana State University

Clifford Nelson, Washington State University
Gary Leske, University of Minnesota
Dean Sutphin, Cornell University
Gilbert Long, Utah State University
Glen Shinn, Mississippi State University
Ed Yoder, Pennsylvania State University
Douglas Bishop, Montana State University
Richard Foster, University of Nebraska
Eddie Moore, Michigan State University
Carlton Morris, Tuskegee Institute

I hope that the papers from the 1986 NAERM will prove useful to all who received them and that all presenters will submit their work for possible publication in a journal. It is time to begin preparing for the 1987 NAERM, and I hope that many of you will submit paper proposals for consideration to Dr. Al Mannebach, University of Connecticut. Any suggestions you may have for improvement of future meetings will be appreciated.

Alan A. Kahler, Chairman
1986 National Agricultural
Education Research Meeting

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A CONTENT ANALYSIS OF THE NATIONAL AGRICULTURAL EDUCATION RESEARCH MEETINGS 1974-1985

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INTRODUCTION

Since 1974, a National Agricultural Education Research Meeting (NAERM) has been held yearly in conjunction with the annual meeting of the American Association of Teacher Educators in Agriculture and the American Vocational Association Convention. The purpose of the research meeting has been to provide an opportunity for the presentation of papers reporting research and critiques of the papers. In more recent years an inservice session on research methodology has been added as a component of the research conference.

At the 1982 NAERM, Maynard Iverson presented a paper entitled "Reporting Research in Agricultural Education--An Analysis of the National Agricultural Education Research Meeting." Iverson (1982) reported that "through the years there has been a steady growth in such quantitative measures as: papers submitted, registrants, paper presenters, other participants, and total individuals involved on the program" (p.2). The thrust of the analysis by Iverson was on quantitative factors with a more indepth look at the 1981 and 1982 National Agricultural Education Research Meetings. For those two years a comparison of studies was conducted on such factors as level of studies, methods, and positions of presenters.

The research reported by Iverson was valuable in the following two respects: 1) the research chronicled some of the history of the National Agricultural Education Research Meeting and 2) the report raised several issues for consideration to insure the continued growth and development of this national forum for research in Agricultural Education. However, Iverson's study was limited to an analysis of primarily demographic factors associated with the NAERM and did not address the content of any of the presentations made at this meeting.

To date, no one in the profession has conducted an indepth study of what has been presented at the National Agricultural Education Research Meeting and what changes have occurred in the subject matter or topics presented at this meeting. Such a study is valuable in ascertaining the trends of research priorities within the profession and identifying topics on which the most research has been reported. Knowledge in both of these areas will, at the very least, tell us where we have been in the profession with respect to conducting research and could be used to provide a basis for deciding where we should be going as agricultural education researchers.

PURPOSE AND OBJECTIVES

The purpose of this study was to do a content analysis of the topics presented at the National Agricultural Education Research Meeting from 1974 to 1985. Answers were sought, through the content analysis, to the following questions:

1. What has been the nature of the contents of the presentations made at the National Agricultural Education Research Meeting 1974-1985.
2. What changes have occurred in the twelve year history of the NAERM with respect to the topics selected for presentation.
3. What topics receive the most attention with respect to research reported at the National Agricultural Education Research Meeting.

PROCEDURE

The procedure used to accomplish the purpose of the study, content analysis, has been used as a research technique in agricultural education only in a limited fashion (Knight, 1984). However, content analysis has received considerable attention in recent years as the research method used by John Naisbitt in gathering information for the nationwide best seller Megatrends. In Megatrends the content analysis was of newspapers and the data gathered was used to analyze our society. According to Naisbitt (1982) content analysis is an effective way to monitor change because the "news hole" in a newspaper system is a closed system. Similarily, the National Agricultural Education Research Meeting is a closed system. Even though the number of presentations may have increased over the years, the rate of acceptance of paper proposals has remained fairly constant at 45 to 55 percent. Thus, there has been limited space for presentations at the NAERM and only the best studies in terms of significance of the problem to agricultural education, soundness of design, clarity of presentation, validity of conclusions and contribution of the research to knowledge about agricultural education should have been selected for presentation. In practice these previously mentioned factors are used as evaluation criteria for proposal selection.

In 1984 Knight used content analysis to determine the nature of the contents of the Agricultural Education Magazine and reported the results at the 1984 NAERM. The procedures used in this descriptive study parallel the procedures used by Knight. An outline of this procedure follows:

1. A review of appropriate literature regarding content analysis as a research technique was conducted.
2. A determination of the scope of the content analysis was made. It was decided to include all presentations of the National Agricultural Education Research Meeting instead of using a sample because the total number was less than 210.

3. Titles of research presentations and, where possible, the text of the presentations were secured. The present format used for disseminating the proceedings of the conference greatly facilitated this effort. Other presentations were located in ERIC and The Journal of AATEA.

4. Categories for evaluating the subject matter of the topics presented at NAERM were selected. The subject index of previous Summaries of Research and Development Activities in Agricultural Education was used as a guide.

5. All topics presented at the NAERM from 1974 to 1985 were evaluated and placed into categories based upon the subject of the presentation. (The titles of the research presentations in 1975 were unavailable).

6. A final report was prepared containing the descriptive data, conclusions, and implications of the findings.

ANALYSIS OF DATA

Using content analyses, data was gathered by evaluating the subject matter of each NAERM presentation and categorizing the topic. The categories selected included the following:

1. Adult Education
2. College Faculties
3. Curriculum
4. Employment Opportunities
5. Future Farmers of America
6. Research Methodology/Impact
7. Special Needs Populations
8. Supervised Occupational Experience
9. Teacher Attitudes and Problems
10. Teacher Training
11. Teaching Effectiveness and Methods
12. Other (Studies not fitting into the previous categories)

RESULTS

Twelve National Agricultural Education Research Meetings, the beginning in New Orleans, Louisiana, in 1974, have been held for the purpose of disseminating agricultural education research. However, the titles of the presentations at the 1975 meeting could not be located, therefore eleven research meetings form the basis for the investigation of the research topics. Data pertaining to the twelve meetings are shown in Table 1.

Table 1

Historical Development of the National Agricultural Education Research Meeting 1974-1985.

Number	Year	Location	Chairman/Institution
1*	1974	New Orleans, LA	Hollie Thomas/Florida State University
2	1975	Anaheim, CA	Hollie Thomas/Florida State University
3	1976	Houston, TX	Glen Shinn/Mississippi State University
4	1977	Atlantic City, NJ	William Richardson/Purdue University
5	1978	Dallas, TX	Ben Byler/Mississippi State University
6	1979	Anaheim, CA	Ron Brown/Mississippi State University
7	1980	New Orleans, LA	L. H. Newcomb/Ohio State University
8	1981	Atlanta, GA	M. J. Iverson/North Carolina State Univ.
9	1982	St. Louis, MO	J. Dale Oliver/Virginia Poly. & S. U.
10	1983	Anaheim, CA	Paul R. Vaughn/New Mexico State Univ.
11	1984	New Orleans, LA	Jimmy G. Cheek/University of Florida
12	1985	Atlanta, GA	Bob R. Stewart/University of Missouri

*Initially called the "Agricultural Research Seminar"

Analysis of Research Topics

There are four principle areas or categories that have received considerable attention in the twelve year history of the National Agricultural Education Research Meeting as shown in Table 2. The category with the most studies reported is that of curriculum, followed closely by research on teacher attitudes/problems and teacher training. Employment opportunities ranked fourth in terms of frequency of papers reported. Supervised Occupational Experience as a research topic was rated fifth with 17 papers presented over the past twelve years. Teaching effectiveness and research on the Future Farmers of America were sixth and seventh respectively.

With respect to changes in research priorities based upon the number of presentations selected by category each year over the twelve year period, it is readily apparent that Supervised Occupational Experience has become an important research topic in recent years. Of the 17 studies presented on SOE, 14 have been presented since 1982. Presentations regarding research on teacher training, attitudes and problems have also increased significantly in recent years. However, the frequency of studies reported in the category of curriculum has remained virtually constant from 1974 to 1985 with either two or three curriculum studies presented each year.

Twelve research papers have been presented at the NAERM concerning special populations with all but one of the 12 presentations ocurring between the years of 1979 and 1985. Special populations as a category, included research studies on non-traditional enrollment in vocational agriculture as well as research on accommodating the handicapped in vocational agriculture.

Table 2

Analysis of the National Agricultural Education Research Meetings by Research Topics.

Year	Adult Educ.	College Ag. Faculties	Curriculum	Employ Oppor.	FFA	Research Meth./ Impact	Special Populations	SOE	Teacher Attitudes/ Problems	Teacher Training	Teaching Effect./ Methods	Non-Categorized	Total
1974			2	3	1		1			2		1	10
1975												9	9
1976		2	1	4	1				1			1	10
1977			3	1	1				1	1	1	1	9
1978			2					2	3		1	2	10
1979	1		3	1			1			2	3	4	15
1980			2	1			3		4	2	3	1	16
1981	1		1	4	2		2	1		4	1	2	18
1982		1	3	2		1	2	4	6	3	2	5	29
1983	4		2	2	2	1	1	6	5	2	2	3	30
1984			3	5	1	1		2	1	3	2	4	24
1985	1	2	3		3	1	2	2	3	5	1	4	27
TOTALS	7	5	25	23	11	4	12	17	24	24	16	37	207

CONCLUSIONS

Based on the results of the study, the following conclusions are made:

1. Research priorities in agricultural education undergo a process of change as evidenced by the flux that has occurred over time in the topics selected for presentation at the National Agricultural Education Research Meeting. The priorities for research in Agricultural Education are not static.

2. The most prevalent topics of research being reported at the NAERM involves teachers, their problems, attitudes, process of preparation and effectiveness.

3. The subject matter of curriculum has been investigated and reported consistently each year in the twelve year history of the National Agricultural Education Research Meeting.

4. Emerging topics of importance in the profession as evidenced by the frequency of studies recently reported at the NAERM are Supervised Occupational Experience and the Future Farmers of American Organization.

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Naisbitt, J. (1982). Megatrends, New York: Warner Books, Inc.

7

A NATIONAL STUDY OF TEACHER EDUCATORS AND STATE SUPERVISORS IN AGRICULTURAL EDUCATION

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INTRODUCTION

We've always been told that the vocational agriculture program in a local community is no better than the vocational agriculture instructor employed in that program. Perhaps less evident, but no less true, is that the quality of vocational agriculture in a state reflects the state-level leadership. A better understanding of teacher educators and state supervisors should provide valuable insights needed to enhance communication and leadership in vocational agriculture.

Foster and Horner (1985) found differences between personality types of teacher educators and supervisory personnel as well as differences in concerns regarding agricultural education. Whereas, Sutphin and Newcomb (1983) revealed a high degree of consensus by teacher educators and state supervisors on views held regarding selected national issues in Agricultural Education. Yet differences were present and a need for further identification and clarification of positions on important issues was indicated.

Crawford et. al. (1976) was instrumental in developing "Standards for Quality Vocational Agriculture Programs in Agriculture/Agribusiness" in which both teacher educators and state supervisors were included. Such standards were a result of both regional and national seminars in which agricultural education professionals studied the issues and concerns of the profession.

Stewart, Shinn, and Richardson (1977) reported the top rated concerns of teacher education throughout the U.S. They indicated that curriculum development, funding, teacher education, teacher shortages, and program evaluation were the broad areas of most concerns to teacher educators. Stewart also described concerns identified within each specific area of teacher education as well.

Bowen (1981) studied job satisfiers and job dissatisfiers of 71 teacher educators. Bowen found that 99 percent of teacher educators had taught vocational agriculture at the secondary level, and had been in their present teacher education position an average of 10.6 years. He found a very high degree of satisfaction among teacher educators.

No national or regional studies were found that examined the characteristics of teacher educators and supervisors for information on job assignments, level of professional activity, views on critical issues and evaluation of areas in need of strengthening for the profession.

PURPOSES AND OBJECTIVES

The primary purpose of this study was to collect and analyze data on selected characteristics of state-level agricultural educators. Specific objective were to:

1. determine demographic characteristics of respondents, including work assignments, rank, job satisfaction, and amount and type of occupational experience.
2. analyze views of each respondent group on critical issues facing vocational agriculture by group and by region.
3. compare perceptions of agricultural education areas in need of strengthening by respondent and region.
4. determine the degree of professional activity of respondents by respondent group and region.

PROCEDURE

The population for this study consisted of all of the 533 teacher educators and state supervisors listed in the 1984-85 National Directories of AATEA and NASAE. Three hundred sixty-seven (69%) responded to the mailed questionnaire. The questionnaire was reviewed for content validity by teacher educator and state supervisory staff in Nebraska. Reliability estimates were calculated using Cronbach's alpha (alpha = .05), yielding a reliability coefficient of .84.

Survey instruments were mailed in bulk to head teacher educators and state supervisors for distribution to their staff. Responses were returned individually to maintain confidentiality. A telephone follow-up was made to a 20% random sample of all nonrespondents. A T-Test comparing data between initial respondents and "nonrespondents" showed no differences, indicating that the study participants were representative of the intended population. All respondents were considered a part of the study for the purposes of analysis of data.

Data was collected between October 1984 and March 1985 and analyzed during Spring and Summer, 1985.

ANALYSIS OF DATA

Descriptive statistics, frequencies, means and standard deviations were appropriately used, since the sample was the total population. ANOVA and Tukey post hoc tests were utilized to ascertain significant differences between group means at the alpha = .05 level. Nonrespondent follow-up comparisons were made using the T-Test (Alpha = .05). Cronbach's alpha was used to determine reliability of the survey instrument.

RESULTS

Some of the major findings that help to describe the 244 teacher educators and 123 state supervisors and their perceptions of various concern and issues are contained in the next several pages by research objective:

Objective 1. Determine demographic characteristics of respondents, including work assignments, rank, job satisfaction, and amount and type of occupational experience.

- Teacher educators had an average tenure of 12.1 years, while state supervisors had an average tenure of 11.5, indicating a high degree of stability in the profession. Years in their present professional areas did not differ significantly by region.

- Three hundred and fifty (95.6 %) of the respondents had taught secondary vocational agriculture. Almost 30 percent had taught at the secondary level from one to four years, while about 33 percent had taught from 5 to 8 years.

- Almost half of the respondents were engaged in administration (16%), secondary supervision (16%) or instructional methods (14%). Less than ten percent has assignments in the combined areas of extension education (4%), international education (2%), inservice education (2%) and supervised occupational experience education (2%). Between five and ten percent were primarily involved in each of the areas of FFA, curriculum, mechanics, planning and coordinating student teaching.

- Twenty-seven percent of the respondents identified themselves as Professors, 17% each were Associate and Assistant Professors, 6% were instructors and 16% each were State Supervisors and Assistant Supervisors.

- Only 10 of the 367 (2.7%) respondents indicated some dissatisfaction with their present occupation. One hundred and sixty respondents (43.6%) indicated they were satisfied while 194 (52.9%) indicated great satisfaction with their present occupation.

Objective 2. Analyze views of each respondent group on critical issues facing vocational agriculture by group and by region.

Table 1 provides information regarding the perception of teacher educators and state supervisors regarding critical issues facing the profession. Of the 10 critical issues considered, only "legislation at the federal and state level", and "declining enrollments in secondary schools" were ranked significantly different.

TABLE 1:
Mean rankings and F-values of critical issues facing agricultural education as perceived by teacher educators and state supervisors.

Issue		T.E (N = 244)	S.S. (N = 123)	Total (N = 367)	F-Prob
Quality of Instruction in Ag Ed	M	4.53	4.95	4.69	.4248
	R	1	2	1	
Legislation at State and Federal Levels	*M	5.09	4.02	4.71	.0081
	**R	4	1	2	
Declining Enrollments in Secondary Programs	M	4.61	5.16	4.80	.0520
	R	2	4	3	
Local Support For Vocational Agriculture	M	4.87	5.11	4.95	.3506
	R	3	3	4	
Public Relations at the Local Level	M	5.31	5.31	5.31	.6964
	R	5	5	5	
Declining Enrollments IN Ag Ed Departments	M	5.42	5.79	5.55	.1272
	R	6	8	6	
Excellence in Education Report Implications	M	5.65	5.57	5.62	.4357
	R	7	6	7	
Public Relations at State and Federal Level	M	5.67	5.97	5.87	.3077
	R	8	7	8	
Economic Implications For Ag Ed	M	6.40	6.17	6.32	.8145
	R	10	9	9	
State and National Leadership in Ag Ed	M	6.16	6.72	6.36	.4555
	R	9	10	10	

* M = Mean ranking score (1 = highest rank, 10 = lowest rank)
** R = Actual rank within respondent group

State supervisors ranked the issues of "Legislation at the state and national level" significantly higher than did teacher educators ($p > .01$), while teacher educators ranked "declining secondary enrollments as an issue of greater concern than did supervisors ($p > .05$).

When analyzed by region, it was observed that the central region regarded "declining secondary school enrollments" as ranking higher in importance than did the southern regions. The opposite was true for "legislation at the state and federal level", which the southern region ranked significantly higher than either the central or eastern region. It was also observed that the western region rank of the importance of the issue regarding "legislation" was higher than that of the central region.

Rankings of critical issues by teacher educators and state supervisors were observed to center around the midpoint of the 1 to 10 ranking scale. Although some statistical differences were observed, the range of mean ranking scores are narrow enough to raise some interesting questions about the practicality of the differences. Respondents in the study may have regarded different issues as being the most important to the extent that no specific set of issues come to the forefront of the profession. This may indicate that they are all of somewhat equal importance or that none are exceedingly important. Whatever the perception, it is evident that teacher educators and state supervisors have not identified a clear cut, identified set of issues to address within the profession.

Objective 3. Compare perceptions of agricultural education areas in need of strengthening by respondent and region.

TABLE 2:
Mean rankings and F-values of agricultural education areas in need of strengthening as perceived by teacher educators and state supervisors.

Item		T.E. (N=243)	S.S. (N=123)	Total (N=366)	F-Prob
S O E Programs	* M	3.26	2.72	3.07	.0465
	** R	1	1	1	
Instructional Program Improvement	M	3.26	3.11	3.21	.4213
	R	2	2	2	
Summer Vo Ag Program	M	4.05	3.22	3.76	.0494
	R	3	3	3	
Adult Education in Agriculture	M	4.63	4.40	4.55	.8764
	R	4	4	4	
High Technology in Agriculture	M	5.10	5.57	5.27	.4469
	R	5	5	5	
Agricultural Mechanics Instruction	M	5.47	5.65	5.54	.5884
	R	6	7	6	
FFA/Student Leadership Organizations	M	6.50	5.60	6.22	.0006
	R	7	6	7	
Vo Ag Facilities Usage	M	6.80	6.28	6.62	.1852
	R	8	8	8	
Extension Education	M	7.40	8.85	7.90	.0001
	R	9	9	9	
International Agricultural Development	M	7.93	9.21	8.39	.0001
	R	10	10	10	

* M = Mean ranking score (1 = highest rank, 10 = lowest rank)
** R = Actual rank with respondent group

Table 2 provides information regarding the 10 areas of the agricultural education profession most in need of strengthening, as reported by teacher educators and state supervisors. Although mean rankings appear somewhat uniform, statistically, state supervisors reported higher rankings on SOE, FFA, and summer programs than did teacher educators (as evidenced by F-Probability scores). However, teacher educators had significantly different rankings for the importance of strengthening international development and extension education programs than did state supervisors. Almost without exception, teacher educators and state supervisors ranked the areas in identical order.

Significant differences were observed between the western region and all other regions in three areas. Western region respondents ranked "adult education" lower than other regions as an area in need of strengthening, but ranked "agricultural mechanics" and "improvement in the use of vocational agriculture facilities" higher in importance than other regions. These differences were observed at the alpha = .01 level. The central, eastern and southern regions provided uniform rankings of the vocational agricultural areas being considered.

Objective 4. Determine the degree of professional activity of respondents by respondent group and region.

An analysis of professional publication revealed that teacher educators had significantly more refereed publications during the past five years (3.6, N = 145) than did state supervisors (1.3, N=23). Significant differences were also observed between regions, as a greater number of refereed publications was reported in the central region (4.2, N=61) than that reported by the eastern region (2.53, N=30).

No differences were observed between respondent groups or regions for number of nonrefereed publications in the last five years. Teacher educators published an average of 4.8 (N=166) while supervisors published an average of 3.8 (N=62). There were also no differences between the average number of state and national presentations (T.E. = 4.8, S.S. = 4.5) or the number of curriculum materials developed (T.E. = 5.4, S.S. = 4.0).

In contrast to teacher educators, supervisors reported significantly more involvement in state level professional activity, while teacher educators reported significantly more involvement in campus-related activity (see Table 3). Both groups reported above average participation in state level activities (T.E. = 3.49, S.S. = 3.86 on a five point scale), and average to slightly below average participation on the national level (T.E. = 2.86, S.S. = 2.83).

The only regional difference in level of activity was observed between the western and eastern region in the level of participation in "National Ag Ed organizations and committees". Eastern respondents were significantly more active. This difference can probably be best explained partly because of the geographic proximity of respondents to various nationally sponsored activities and headquarters of national organizations.

Table 3:
Mean ratings and F-values of level of participation in community and professional activities by teacher educators and state supervisors.

Type of Activity	T.E. (N=243)	S.S. (N=123)	Total (N=366)	F-Prob
Civic and community organizations	3.04	3.08	3.06	.9598
Campus organizations and committees	3.79	2.07	3.24	.0001
State Ag Ed organizations and committees	3.49	3.86	3.61	.0016
National Ag Ed organizations and committees	2.86	2.83	2.85	.5586

Rating scale: 1 = not active, 2 = somewhat active,
3 = average participation, 4 = pretty active, 5 = very active

CONCLUSIONS AND RECOMMENDATIONS

This study of state and national leadership in agricultural education supports several previous findings. Average tenure of both teacher educators and state supervisors (12.1 and 11.5 years respectively) are very similar to those reported by Bowen (10.6 in 1981), as is the percentage of respondents (95.6%) who were previous teachers of secondary vocational agriculture programs. It was observed that over 95% of the respondents indicated being "satisfied" or "very satisfied" with their present position. This also supports previous findings by Bowen (1981).

It can be concluded that there is general consensus by teacher educators and state supervisors on the ranking of critical issues and areas needing strengthening. However, important differences do exist between respondent group and regions. However, the lack of clear cut issues emerging as focal points from the respondents may lead one to hypothesize that the profession has not cooperatively defined the foremost important issues on which to concentrate and solve.

Recommendation: Teacher educators and state supervisors meet and confer to identify which issues affecting the profession are of most importance and worthy of a cooperative, concentrated effort to arrive at solutions.

When areas in need of strengthening were ranked and reported, both teacher educators and state supervisors provided almost identical rankings. Sutphin and Newcomb reported similar uniformity (1983) in an earlier study. The high priority issues and needs identified for strengthening appeared to be traditional (FFA, SOE, classroom, and summer programs), in contrast to areas such as international development, extension education, and high technology. Teacher educators appeared to be a bit more open to strengthening "new" areas, while supervisors appeared to be a bit more inclined to want to safeguard the traditional vocational agriculture education program. This may indicate that each group may be providing more direction and support to their specific job assignment area rather than taking a broader look at the entire profession.

Recommendation: Teacher educators and state supervisors should meet and confer to identify the most appropriate definition for "agricultural education", and plan activities that mutually and cooperatively supports all facets of the profession.

Recommendation: Teacher educators and state supervisors meet and confer to identify the areas of the profession in most need of strengthening to better insure that the profession can provide a viable and challenging program in the years ahead. Special attention should be given to new technology in agriculture and in education for integration in all facets of the profession.

It was observed that both respondent groups participate at an average or above average level in state and national professional activities and participate in the publication and dissemination of professional materials. The only differences were observed (as would be expected) in the area of publication of refereed articles.

There were not a great amount of regional differences observed in the study. Several differences observed could be attributed to geographic proximity to national activities and organizations. On the whole, regional perceptions and level of participation in the profession are quite similar.

Recommendation: National activities for which western region participation is required be moved to more regional locations to promote a greater balance of professional participation.

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A National Study of Teacher Educators and State Supervisors In Agricultural Education
A Critique

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The author is to be commended for a powerful leading paragraph in this manuscript. The literature cited presents a review of studies; however, a succinct synthesis of the literature is lacking. It is suggested that this author consider reorganizing the last five paragraphs of the introduction to more accurately and clearly describe the status and implications of previous research. The purpose and objectives of this study as stated were clearly outlined and measurable. Although the researcher may have placed himself in a precarious position by rating programs and state-level leadership against a criterion reference, opening statements suggested this may have been the focus of the study. The intriguing statement, "the quality of vocational agriculture in a state reflects the state-level leadership," was not specifically addressed in the objectives of the study. This researcher proceeded to identify characteristics, analyze views and compare perceptions, which the reader must assume reflect the composite of effective leadership.

The procedures used in this study are clearly outlined. Appropriate follow-ups and statistical tests were conducted to determine if study participants were representative of the intended population. This procedure lends credibility to the study. The statistical techniques employed were clearly defined and appropriate for the study. It was interesting to this reader that the researcher not only used descriptive statistics, but he compared the results as presented by teacher educators to that of state supervisors, making the study more meaningful and interesting.

Although critical issues and areas in need of strengthening as presented in Table 1 and Table 2 may seem valid to the informed reader, no indication was given as to how the ten issues and areas were identified or selected. Objective four was also met by determining the degree of professional activity; however, it would have been more beneficial to the profession if "standards of quality" could have been determined in the research design rather than present "an average" by which we should aspire to become leaders in vocational agriculture. The results were presented in a fashion which was very readable, consistent, and meaningful. Although the manner in which information was presented was acceptable to this reviewer, the author chose to make inferences and explanation of results within the text of the Results section. Some researchers feel strongly that these kinds of statements should be reserved for the Conclusions and Recommendations part of the manuscript.

The Conclusions and Recommendations section of this report was well written. Each conclusion was followed by an appropriate recommendation. In view of changes which have taken place in vocational agriculture programs across the nation and pressures which are currently being experienced, it should behoove us as agricultural educators to follow the recommendations of this author in planning ahead for the future so that vocational agriculture and agricultural education might remain in its place of prominence among vocational education in the United States.

A PROFILE OF THE EFFECTIVE VOCATIONAL AGRICULTURE TEACHER

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INTRODUCTION

Educators have long desired to discover valid and reliable criteria which could be used to distinguish the effective from the less effective teacher. Research attempting to identify valid and reliable teacher effectiveness criteria has been conducted since the late 1800's. It has only been during the last two decades, however, that evidence has been provided which links some teacher behaviors to student achievement. Reviews of teacher effectiveness research such as those provided by Kash and Borich (1982), The School Improvement Model Project (Blackmer, Brown, Pickney and Walker, 1981) and Medley (1979) have given researchers a solid base upon which to proceed with future teacher effectiveness studies.

As practiced today, the identification of effective teachers is not necessarily based on sound, research-supported criteria. Effective vocational agriculture teachers, for example, have been identified as being effective based largely on the testimony of expert opinion or personal experience. Until efforts are made to identify behaviors and characteristics of the effective vocational agriculture teacher, based on research-supported criteria, there is little that can be done to improve the effectiveness of vocational agriculture teachers in general.

PURPOSE AND OBJECTIVES

The purpose of this study (Rheault, 1985) was to create a profile of the effective vocational agriculture teacher by identifying distinguishing behaviors and characteristics using selected teacher effectiveness criteria. The specific objectives of this research were to:

1. Determine effectiveness groups of vocational agriculture teachers from 12 north central states using research-supported effectiveness criteria.
2. Identify teacher effectiveness behaviors which distinguished vocational agriculture teachers.
3. Identify demographic characteristics associated with vocational agriculture teachers responding most like established teacher effectiveness criteria.

PROCEDURE

Vocational agriculture teachers from twelve north central states served as the population for the study. A systematic sample of 330 teachers was selected to participate in the study from the total population of 3212 teachers. Another 220 teachers were systematically selected as substitutes to be used in cases of nonresponse from the original sample of 330 teachers. Only substitutes needed to replace nonrespondents were used in the study. Substitution guidelines as provided by Chapman (1983) were strictly adhered to in the study.

The design of the study utilized descriptive survey methodology. Two instruments were developed to obtain the information needed to meet the objectives and purpose of the study. The first instrument consisted of 40 teacher behavior statements classified under five teacher performance areas. The five teacher performance areas were: productive teaching techniques; structured class management; positive interpersonal relationships; professional responsibilities; and personal characteristics. Each of the 40 teacher behavior statements required the respondent to answer using any whole number from one (never) to nine (always) based on their use of the behavior in their actual teaching practices. The 40 teacher behavior statements were developed using research-supported teacher effectiveness criteria. The instrument was field tested for clarity and validity before being mailed to the selected respondents.

A second instrument was developed to collect specific demographic information on selected respondents. Demographic questions were categorized under six general areas: personal background; school setting; vocational agriculture program; professional activities; civic activities; and educational activities.

The first instrument was mailed to the vocational agriculture teachers, including substitutes, on January 30, 1985. Sixty-three percent of the instruments were properly completed and returned by the original sample of 330 teachers. No follow-up attempts were undertaken to increase the response rate. One hundred twenty-two substitutes were used to replace nonrespondents from the original sample group, yielding a substitution rate of 37 percent. A ten percent sample of nonrespondents were randomly selected for a follow-up to determine if significant differences existed among respondents, nonrespondents and substitutes. Comparisons made among the three groups revealed that all were nearly identical to each other.

The second instrument was mailed to 103 selected respondents on March 15, 1985. An additional mailing was made to nonrespondents of the second instrument on April 12, 1985. From the two mailings, 95 percent of the instruments were properly completed and returned.

ANALYSIS OF DATA

Group means, standard deviations and frequency counts were computed on all items. T-tests were calculated to test for significant differences between teacher effectiveness groups formed in the study when comparing their mean response scores to the teacher behavior statements. The statistical procedures utilized in the study were designed to identify common behaviors and characteristics inherent with effective vocational agriculture teachers and not to demonstrate causality among variables. A reliability alpha coefficient (Cronbach's Alpha) was calculated for the 40 teacher behavior statements as a group (.82) along with reliability coefficients for each of the five teacher performance areas comprising the 40 teacher behavior statements. The reliability coefficients for the five teacher performance areas ranged from .62 to .79. An alpha level of .01 was used to set the confidence limits for the responses received from the first instrument relating to the 40 teacher behavior statements. An alpha level of .05 was used to set the confidence limits for the responses to the demographic variables in the second instrument.

RESULTS

A major assumption involved with satisfying the first objective of the study, which sought to determine effectiveness groups of vocational agriculture teachers, was based on the premise that effective teachers use more of the effective teacher behaviors to a higher degree than do less effective teachers. Thus, the responses given by the respondents to the 40 teacher behavior statements used in the first instrument served as the basis for determining the teacher effectiveness groups identified in the study.

For each respondent of the first instrument, a total response score was calculated by adding together the responses to the 40 teacher behavior statements. Negatively correlated behavior statements were recoded to align all responses in a positive direction. The total response score for each respondent had a possible range of between 40 and 360 based on a possible response range of one (never) to nine (always) for each of the 40 individual statements. Actual response scores for the 330 selected respondents ranged from 182 to 313. Since the distribution of total response scores was found to be normally distributed, it was determined that all total response scores located one or more standard deviations in either direction of the group mean total response score would serve as the cut-off point for the teacher effectiveness groups identified by the study. Through this procedure, it was found that the group considered to be highly effective included total response scores ranging from 282 to 313. The group of teachers whose total response scores were located one or more standard deviations below the group mean score had total response scores ranging from 182 to 237. The high and low teacher effectivenesss groups which resulted from this procedure formed the core sample used to meet Objectives 2 and 3 of the study.

Objective two sought to identify teacher effectiveness behaviors which distinguished the effective vocational agriculture teacher from the less effective. The responses to the 40 teacher behavior statements provided by the 49 respondents in each of the high and low teacher effectiveness groups were used to identify any distinguishing teacher effectiveness behaviors between the groups.

The 40 teacher behavior statements used in the first instrument were classified under five teacher performance areas (Table 1). As would be expected, the high teacher effectiveness group had significantly higher mean response scores for all five of the teacher performance areas when compared to teachers identified in the low group. The three performance areas having the most significant means score difference were: productive teaching techniques (t-values=-23.64); positive, interpersonal relationships (t-values=-16.46); and organized, structured class management (t-values=-12.96). The results support the fact that vocational agriculture teachers who use effective teaching behaviors to high degree do so across the realm of teacher performance areas.

Table 1. Means, Standard deviations and t-values of teacher effectiveness groups by teacher performance areas

Performance area		Groups		t-value[b]
		Low	High	
		(N=49)	(N=49)	
Productive teaching techniques	Mean	5.12	6.92	
	SD[a]	0.41	0.36	-23.62
Organized, structured class management	Mean	5.40	6.90	
	SD	0.56	0.62	-12.96
Positive interpersonal relationships	Mean	5.77	7.43	
	SD	0.52	0.51	-16.46
Professional responsibilities	Mean	6.76	7.89	
	SD	0.79	0.60	- 8.15
Personal characteristics	Mean	6.45	7.89	
	SD	0.80	0.49	-10.91

[a] Standard deviation.

[b] t-value of 2.575 significantly different at .01 alpha level.

Note: Response scale represented a continuum from 1 (never used the behaviors) to 9 (always used the behaviors).

Through individual analysis of the responses to the 40 teacher behavior statements, it was found that significantly different mean scores existed between the groups for 35 of the 40 statements. The six statements having the largest mean score differences between groups included: Feel enthusiastic towards their work, seek ways to motivate students by providing opportunities for successful learning activities, seek ways to involve parents of students in program related activities, keep informed about your students with special health needs, help students locate supplementary materials for subject matter content, and use long range plans to guide the improvement of their program.

All five of the statements for which mean scores between groups were not significantly different were negatively correlated teacher behavior statements. An example of a negatively correlated teacher behavior statement used in the study is "Use lecture to teach most of the course information." This suggests that a majority of the low effectiveness group teachers were not less effective because they were using negatively correlated teacher behaviors in their teaching practices, but rather that they were using the positive teacher behaviors to a lesser degree than were the high teacher effectiveness group members.

The third objective of the study sought to identify demographic characteristics associated with the effective vocational agriculture teacher. A total of 20 selected demographic questions were used to accomplish this objective. From the data received, 12 demographic variables were found to exist which differentiated between teachers considered to be highly effective and those considered to be less effective (Table 2).

Table 2. Means, standard deviations and t-values of significantly different demographic variables by teacher effectiveness groups

Variable		Groups		[b]t-value
		Low	High	
		(N=49)	(N=49)	
Age of the respondents	Mean	34.37	39.96	
	[a]SD	9.54	10.17	-2.81
Years of teaching experience	Mean	11.00	14.60	
	SD	9.09	9.48	-1.97
Years of farm residence	Mean	19.41	24.41	
	SD	8.97	10.79	-2.49
Years of residence at present location	Mean	11.69	16.92	
	SD	10.10	12.48	-2.28
Percent of students having active SOE programs	Mean	70.10	81.73	
	SD	29.53	27.20	-2.03
Professional organization memberships	Mean	3.92	4.92	
	SD	2.19	2.68	-2.49
Civic organization memberships held by respondents	Mean	1.10	2.10	
	SD	1.20	1.39	-3.82
Leadership positions held within professional organizations	Mean	1.41	3.51	
	SD	1.84	3.73	-3.54
Leadership positions held within civic organizations	Mean	1.27	2.90	
	SD	2.49	3.42	-2.70
Hours (semester) of formal education since completing bachelor of science degree	Mean	21.77	30.54	
	SD	19.91	17.64	-2.30
Workshops participated in during the last two years	Mean	3.39	4.73	
	SD	2.19	2.56	-2.80
Field days attended during the last two years	Mean	1.92	3.25	
	SD	2.02	2.12	-3.17

[a] Standard deviation

[b] t-value of 1.96 significantly different at .05 alpha level.

Several of the demographic variables used in the study did not differentiate between teachers considered to be highly effective and those considered less effective. These variables were: years of vocational agriculture completed, preparation time during school day, number of students enrolled in vocational agriculture, percent of workload related to FFA activities, and number of secondary school students enrolled in the school.

CONCLUSIONS AND RECOMMENDATIONS

The findings of this study indicate that effective vocational agriculture teacher behaviors and characteristics can be reliably determined based on their use of research-supported teacher effectiveness criteria. A profile consisting of 31 behavior items and 12 demographic variables related to the effective vocational agriculture teacher was the direct result of these findings. The profile follows:

Productive Teaching Behaviors

The effective vocational agriculture teacher:

1. Develops course activities which reflect "lifelike" situations, relating current lessons to past lessons.
2. Utilizes learning activities which are designed to achieve predetermined objectives for the course.
3. Motivates students by providing successful learning activities at each student's ability level, yet challenges students to higher scholastic expectations.
4. Evaluates his/her performance and accepts honest feedback from students for continued improvement.
5. Very often provides written comments on exams to facilitate student learning.
6. Will sometimes need to further explain assignments to students even after directions are given.
7. Uses lectures to convey course information less than 50 percent of the time.
8. More often than not will design educational activities for the class as a whole rather than for individual students.
9. Very often seeks the advice of experts in the subject matter he/she teaches.
10. Almost always helps students locate supplementary materials to subject matter content being covered in class.

Organized, Structured Class Management

The effective vocational agriculture teacher:

11. Utilizes long range plans to guide improvement of the vocational agriculture program.
12. Establishes a given set of rules and procedures to manage student behavior.
13. More often than not will allow for student input when establishing classroom rules and procedures.
14. Purposely adjusts and rearranges the classroom to provide for a variety of learning activities within the classroom.
15. Confronts students when they are not doing their assigned task.
16. Presents information on the blackboard which can be read by all students.
17. Sometimes uses textbooks to provide most of the printed information given to students.

Positive Interpersonal Relationships

The effective vocational agriculture teacher:

18. Encourages friendly and respectful relationships with students, feeling students within her/her class can be trusted.
19. Rarely uses sarcasm in the classroom.
20. Constructively criticizes students for further educational improvement.

21. Keeps informed about students needing special assistance while willingly provides time to any student needing help.
22. Seeks ways to involve parents of students into program related activities.
23. Shares teaching ideas and methods with other teachers in the school.
24. Sometimes categorizes students by their needs (cultural, academic, intellectual, etc.).
25. Recognizes students for their efforts which are worthy of praise.

Professional Responsibilities

The effective vocational agriculture teacher:

26. Demonstrates that he/she is a responsible person by completing duties in a timely manner.
27. Keeps abreast of new developments within his/her profession through participation in workshops, field days and seminars.
28. Rarely by-passes school policy even if conditions warrant the action.

Personal Characteristic Behavior

The effective vocational agriculture teacher:

29. Usually displays personality traits such as humor and patience which promote positive interaction with students.
30. Almost always feels enthusiastic towards his/her work.
31. Feels capable of handling any of the challenges associated with his/her work and copes easily with the changing situations occurring within the classroom environment.

Profile of Demographic Characteristics

The effective vocational agriculture teacher:

32. Is older than the average vocational agriculture teacher and has a proportionate amount of teaching experience.
33. Is presently living on a farm or has lived on a farm, usually for more than 10 years.
34. Has been a resident of the community in which he/she teaches for at least four years.
35. Usually has had a minimum of at least one year of high school vocational agriculture, but it is not significant if he/she did not complete any vocational agriculture.
36. Teaches in a school which serves mostly rural students or a combination of rural and urban students.
37. Teaches in a program which offers year-long or a combination of year-long and semester courses.
38. Usually teaches some type of adult class or group.
39. Spends approximately 22 percent of his/her total workload on FFA related activities.

40. Has a high percentage of students with active supervised occupational experience programs.
41. Holds membership in five professionally related organizations and usually holds at least one leadership position.
42. Is a member of two civic organizations or clubs and usually has held at least one leadership position.
43. Continues to complete formal education classes throughout his/her teaching career.

It is recommended that the profile be used for vocational agriculture teacher self-evaluations or by school administrators who supervise vocational agriculture teachers to improve the effectiveness of their teachers. The study should be replicated in other areas of the United States to determine whether the results are consistent with vocational agriculture teachers as a whole. Researchers conducting similar investigations should continue to seek current research findings which reflect the state-of-the-art concerning criteria on teacher effectiveness.

As a final point, it should be emphasized that not all teachers considered to be effective would be expected to conform to any one specific behavior or characteristic described within the study. Exceptions to the generalizations would be expected. It is the combined effect of behaviors and characteristics which causes teachers to be profiled as effective.

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A Profile of the Effective Vocational Agriculture Teacher
A Critique

Vernon D. Luft, North Dakota State University -- Discussant

Teacher effectiveness is a topic of interest to most teacher educators, state supervisors, and vocational agriculture teachers. The purpose of this study was to create a profile of the effective vocational agriculture teacher by identifying distinguishing behaviors and characteristics using selected teacher effectiveness criteria. I commend the researchers for conducting a study that is not only important to the profession, but interesting and easy to comprehend.

Strengths

1. A theoretical framework from which the problem was developed was provided.

2. The purpose and objectives were clearly stated.

3. In general, the research procedures used were sound. However, I do have a couple questions which will be addressed under weaknesses.

4. Means, standard deviations, and frequency counts were used to describe; the t-test was used to test for significant differences. These statistical procedures were appropriate.

5. The results were reported clearly and concisely and were supplemented with appropriate tables.

6. The authors presented a listing in the conclusions consisting of 31 behavior items and 12 demographic variables profiling the effective vocational agriculture teacher. I compliment them for doing so. It tends to pull the entire study together and make it more meaningfull to the reader.

Weaknesses--those found in this report are mostly related to procedures as I mentioned earlier. They are:

1. The author referred to drawing a systematic sample of 330 teachers, with another 200 teachers selected as substitutes to be used in cases of non-responses. They further indicate that substitution guidelines provided by Chapman were strictly adhered to. For those of us who are not familiar with Chapman's substitution guidelines, a brief description of the procedure would be helpful.

2. The explanation of follow-up procedures leaves cause for questions. First, the authors indicate, "Sixty-three percent of the instruments were properly completed and returned by the original sample of 330 teachers. No follow-up attempts were undertaken to increase the response rate." Two sentences later they reported, "A ten percent sample of non-respondents were randomly selected for a follow-up to determine if significant differences existed among respondents, non-respondents, and substitutes." Apparently, follow-up procedures were used. Why the discrepancy in the two statements? Just how were the procedures conducted?

The researchers are to be commended for conducting an excellent study that has potential of being useful to the agricultural education profession.

ANALYSIS OF NEEDS: EDUCATIONAL PROGRAMS FOR YOUNG AND ADULT FARMERS

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INTRODUCTION

American agriculture has always been on the cutting edge of change. Keeping up with change is becoming increasingly challenging to the American farmer as well as all those individuals who may assist the American agricultural industry to be the major industry that it is today. Education has and still is a key element in helping agriculturalists meet the challenges of agriculture. Predictions are that education will be the critical element in the coming agricultural revolution in the United States and the world (Crom, 1985). Adult and young farmers continually seek solutions to complex problems.

Adult and young farmer educational programs have always been an important part of agricultural education (Kahler, et al 1985). However, in recent years, many questions have been raised regarding the need for adult education delivered through vocational agriculture departments as well as concerns about the focus of these programs. Woodin (1967) in a national study of vocational agriculture teaching activities found that 51.6 percent of the teachers reported that they taught adult farmers. In 1974, Schuman and Webb found that both teachers and high school principals in Texas agreed that adult instruction should be included in vocational agriculture programs.

However, there appears to be a considerable difference in perception as to the role of adult education in vocational agriculture judging by recent related research. Pfister (1983) stated that vocational agriculture teachers in Ohio do not involve student teachers in adult education activities to any great extent, and teacher educators do not emphasize adult education to the extent that they expect it to be conducted. Miller et al (1983) found that conducting adult educational programs presented the greatest challenge to vocational agriculture teachers regardless of the number of years of experience. However, there are indications adult education may be needed more now than ever.

What types of educational programs are currently being offered? How important are these programs to young and adult farmers? What is the quality of these programs? How effective have these programs been in assisting farmers to adopt new technology? What are the current educational interests of young and adult farmers and where do farmers get their most useful information?

PURPOSE AND OBJECTIVES

The main purpose of this study was to assess the current educational programming being offered to young and adult farmers in Iowa. This assessment centered on what program areas were being offered, the degree of importance, and the quality of these programs as perceived by young and adult farmers in Iowa. Additionally, the study was conducted to determine areas of interest for further education and to determine the source of information most used by young and adult farmers.

PROCEDURES

The study was Phase I of a five-phase project to review various aspects of agricultural education for adults in Iowa. The study was designed to collect descriptive data to assess the current status of adult education in agriculture and to identify future program development needs.

Data were collected by self-administered mailed questionnaires sent to a randomly selected group of young and adult farmers who had attended adult education programs during the 1983-1984 program year. Three hundred young and adult farmers were randomly selected from the lists of participants in adult agricultural education classes or programs.

The participants were selected from mailing lists provided by vocational agriculture teachers in Iowa having reported that they had conducted regular adult education programs during this period. Fifty-two percent of the potential participants in the study responded to the questionnaire. This response was considered to be adequate given the fact that, traditionally, farmers do not respond well to surveys (Lasley, 1985, Howe, 1977). Follow-up letters and questionnaires were sent approximately two weeks after the initial mailing. Follow-up phone calls were made to approximately 20 adult and young farmers to assess any differences in responses compared to the individuals originally responding. There were no significant differences in these responses from those of the original respondents.

The questionnaire was developed utilizing the assistance of a panel of experts in the Department of Agricultural Education at Iowa State University and selected agricultural Extension personnel. A list of potential program topics was generated and refined. These topics was classified as to livestock population (LP), crop production (CP), agricultural mechanics (AM), horticulture (HT), and general agriculture (GA). Each respondent was to rate (using a five point Likert scale), the degree of importance, quality and interest regarding each topic. Respondents were also asked to rate their primary sources of new information and give selected biographical data.

ANALYSIS OF DATA

The data were analyzed using means, standard deviations, frequencies and percentages. Cronbach Alpha reliability coefficients were determined for each of the major interest scales as follows: LP=(.91); CP=(.88); HT=(.88); GA=(.90).

RESULTS

The findings of this study indicated that a large percentage of the respondents rated the programs high on the quality scale (3.00 or higher). Educational programs rating fair or low on quality were surveying, vegetable production, and government regulations. The highest composite quality scores were assessed programs on facilities construction, safety, and taxes. (Tables 1, 2, 3, 4, 5)

The programs of the greatest importance (4.00 or higher) to farmers responding to the questionnaire were livestock marketing (4.12), crop marketing (4.26), agricultural credit (4.12), and financial planning (4.23). The programs of perceived lesser importance (3.00 or lower) were surveying, vegetable production, and turf management. (Tables 1, 2, 3, 4, 5)

The program area of greatest interest for future delivery was crop marketing (4.13). No other program interest area came close to this rating. The lowest rated (below 3.00) interest areas included herd record keeping, breeding and reproduction, use of computers, electric power, small engines repair, facilities construction, surveying, land measurements, concrete and masonry, safety, vegetable production, fruit production, landscaping and turf management. (Tables 6, 7, 8, 9, 10)

According to the respondents in this study, the following sources of information were the most important to them: magazines (3.91), friends, neighbors and other farmers (3.82), radio (3.74), and newspapers (3.48). (Table 11)

Basic information gathered to describe the respondents indicated that over 90% of the respondents were males; 90% were between ages of 20 and 49; 80% were full-time farmers; 86% of the respondents live on farms; 36% of the respondents had at least a high school education; 36% had some education beyond high school which included some college or technical schooling and 22% had attained a B.S. degree and 2% a M.S. degree; 54% had gross incomes from all sources of over $50,000 and 62% indicated that over 75% of their gross income was from farming.

CONCLUSIONS

Based on the findings of this study, the following conclusions can be made: (1) As a group, farmers participating in this study had a high degree of formal education and had interest in more education; (2) Farmers rated their educational programs fairly high in quality; (3) Farmers placed a very high priority on educational programs on marketing, credit and financial planning; (4) Farmers rated non-traditional program areas fairly low on interest and quality scales; (5) Farmers primarily rely on magazines and friends, neighbors, and other farmers and radio for information.

RECOMMENDATIONS

Based on the findings of this study and the review of the literature, the following recommendations were made:

1. Adult education programs should focus more on planning, goal setting, financial analysis, and marketing and less on production.
2. Because farmers are becoming more educated and sophisticated, agricultural educators, at all levels, should learn to become more facilitators of the educational process by planning and conducting educational programs with farmers and not merely for farmers.
3. Agricultural educators need to recognize the importance of adult education and plan accordingly to meet adult needs.
4. Conduct further studies on the methodologies most appropriate for delivery of adult education to meet the needs of a rapidly changing agriculture.

EDUCATIONAL IMPLICATIONS

High priority ratings for educational programs on marketing and financial planning reflect the current situation in rural Iowa, in particular, and rural American, in general. This finding is not surprising, but it does underscore the great opportunity that professionals in agricultural education have for providing leadership in delivering education to those people who want and need it most. The information collected through this study also underscores a major shift in adult education from an emphasis on increasing production of crops and livestock to an emphasis on management, planning, and marketing. This shift is significant because it represents a business and analytical approach to the agriculture industry at the farm level.

The data also indicate that some non-traditional educational programs are being delivered. This effort may be the start of some new trends in agriculture in Iowa.

Finally, the data indicate that young and adult farmers want more education and they will go to those educators most willing to offer it.

Table 1. Importance and quality of educational programs offered in livestock production as rated by Young and Adult Farmers in Iowa.

Educational Programs	Programs Offered	Importance Mean	Importance SD	Quality Mean	Quality SD
Health and Diseases	45	3.91	1.05	3.28	.96
Marketing	67	4.12	1.16	3.30	.89
Feeds & Feed	41	3.66	.99	3.27	.90
Production Management	54	3.82	.99	3.20	.79
Production Records	45	3.80	1.16	3.23	.94
Herd Records	28	3.42	1.10	3.31	1.05
Breeding & Reproduction	29	3.52	1.09	3.31	1.04
Use of Computer	43	3.28	.96	3.38	.96
GROUP SUMMARY		3.85	.82	3.31	.64

Table 2. Importance and quality of educational programs offered in crop production as rated by Young and Adult Farmers in Iowa.

Educational Programs	Programs Offered	Importance Mean	Importance SD	Quality Mean	Quality SD
Pests and Diseases	59	3.73	1.11	3.40	.94
Crop Pesticides	64	3.67	1.13	3.33	.86
Soil Fertility	67	3.87	1.11	3.55	1.06
Chemical Safety	59	3.92	1.18	3.29	1.13
New Crop Varieties	41	3.68	1.11	3.32	.88
Marketing	71	4.26	1.09	3.51	.96
Production Management	58	3.85	1.09	3.28	.85
Production Records	43	3.77	1.21	3.41	.94
Use of Computer	44	3.29	.94	3.37	.92
GROUP SUMMARY		3.89	.88	3.35	.72

Table 3. Importance and quality of educational programs offered in agricultural mechanics as rated by Young and Adult Farmers in Iowa.

Educational Programs	Programs Offered	Importance Mean	Importance SD	Quality Mean	Quality SD
Machinery Calibration	35	3.83	1.18	3.37	1.09
Machinery Maintenance	32	3.97	1.18	3.41	1.01
Electric Power	16	3.44	.96	3.47	.99
Small Engine Repair	15	3.21	.58	3.21	.70
Facilities Construction	11	3.36	1.03	3.64	.92
Welding	18	3.17	1.15	3.22	1.11
Cutting	15	3.07	1.03	3.20	.94
Surveying	8	2.63	1.06	2.75	.89
Land Measurements	11	3.09	1.04	3.09	.94
Concrete	11	3.55	1.13	3.60	1.17
Masonry	7	3.43	.79	3.71	1.11
Safety	21	3.86	1.20	3.95	1.02
GROUP SUMMARY		3.70	.98	3.42	.91

Table 4. Importance and quality of education programs offered in horticulture as rated by Young and Adult Farmers in Iowa.

Educational Programs	Programs Offered	Importance Mean	Importance SD	Quality Mean	Quality SD
Vegetable Production	7	2.67	.82	2.67	.82
Fruit Production	4	3.33	.58	3.00	1.00
Landscaping	13	3.25	1.22	3.09	1.04
Turf Management	4	3.00	.00	3.00	.00
GROUP SUMMARY		3.16	1.12	3.08	.94

Table 5. Importance and quality of educational programs offered in general agriculture as rated by Young and Adult Farmers in Iowa.

Educational Programs	Programs Offered	Importance Mean	Importance SD	Quality Mean	Quality SD
Financial Planning	61	4.23	1.07	3.57	.97
Taxes	47	3.98	1.07	3.77	1.05
Agriculture Credit	49	4.12	1.03	3.53	1.06
Government Programs	48	3.68	1.18	3.19	1.12
Government Regulations	28	3.26	1.35	2.89	.95
Computer Use	45	3.31	1.00	3.18	.82
Decision Marketing	32	3.26	1.15	3.07	1.09
Estate Planning	32	3.41	1.29	3.33	1.03
Water Quality	11	3.55	1.44	3.30	1.34
Air Quality	10	3.80	1.32	3.56	1.24
Wildlife Management	14	3.77	.93	3.58	.67
Natural Resources	13	3.50	1.00	3.55	1.13
Leadership in Agriculture	20	3.35	1.27	3.56	1.93
Human Relations in Agriculture	17	3.50	1.16	3.47	1.06
GROUP SUMMARY		3.84	.89	3.33	.81

Table 7. Level of interest in educational programs dealing with topics in crop production as rated by Young and Adult Farmers in Iowa.

Educational Programs	Valid Cases	Interest Mean	Interest SD
Pests and Diseases	140	3.27	1.13
Crop Pesticides	140	3.27	1.22
Soil Fertility	141	3.86	1.11
Chemical Safety	141	3.50	1.18
New Crop Varieties	141	3.55	1.21
Marketing	141	4.13	1.17
Production Management	141	3.82	1.21
Production Records	141	3.61	1.20
Use of Computer	141	3.04	1.41
GROUP SUMMARY		3.56	.86

Table 6. Level of interest in educational programs dealing with topics in livestok production as rated by Young and Adult Farmers in Iowa.

Educational Programs	Valid Cases	Interest Mean	Interest SD
Health and Diseases	141	3.16	1.26
Marketing	141	3.62	1.38
Feeds & Feeding	141	3.07	1.27
Production Management	141	3.33	1.29
Production Records	141	3.21	1.34
Herd Records	141	2.81	1.31
Breeding & Reproduction	141	2.93	1.38
Use of Computer	141	2.86	1.39
Group Summary		3.12	1.04

Table 8. Level of interest in educational programs dealing with topics in agricultural mechanics as rated by Young and Adult Farmers in Iowa.

Educational Programs	Valid Cases	Interest Mean	Interest SD
Machinery Calibration	140	3.21	1.30
Machinery Maintenance	140	3.25	1.26
Electric Power	139	2.89	1.17
Small Engine Repair	140	2.58	1.25
Facilities Construction	140	2.83	1.11
Welding	140	3.05	1.32
Cutting	140	2.86	1.28
Surveying	140	2.25	1.15
Land Measurements	140	2.48	1.25
Concrete	140	2.63	1.22
Masonry	140	2.22	1.14
Safety	140	2.81	1.32
GROUP SUMMARY		2.76	.88

Table 9. Level of interest in educational programs dealing with topics in horticulture as rated by Young and Adult Farmers in Iowa.

Educational Programs	Valid Cases	Interest Mean	Interest SD
Vegetable Production	139	2.04	1.24
Fruit Productin	139	2.02	1.26
Landscaping	140	2.49	1.37
Turf Management	140	1.97	1.25
GROUP SUMMARY		2.14	1.10

Table 11. Importance of sources of new informationn as rated by Young and Adult Farmers in Iowa.

Educational Programs	Valid Cases	Interest Mean	Interest SD
Newspaper	140	3.48	1.15
Radio	140	3.74	1.06
Television	139	3.40	1.11
Agri-Infodata Service (AIDS)	137	2.65	1.26
Extension Agent	139	2.96	1.23
Agri-business Representative	139	3.27	1.01
Extension Service Publications	139	3.43	1.08
Magazines	137	3.91	.98
Friends, neighbors, other farmers	138	3.82	1.05
Vocational Agriculture Teacher	138	2.99	1.14

Table 10. Level of interest in educational programs dealing with topics in general agriculture as rated by Young and Adult Farmers in Iowa.

Educational Programs	Valid Cases	Interest Mean	Interest SD
Financial Planning	140	3.73	1.19
Taxes	140	3.54	1.19
Agriculture Credit	140	3.56	1.25
Government Programs	140	3.37	1.18
Government Regulations	140	3.01	1.23
Computer Use	140	3.01	1.39
Decision Making	140	3.36	1.24
Estate Planning	140	3.22	1.18
Water Quality	140	2.79	1.20
Air Quality	140	2.68	1.19
Wildlife Management	140	2.81	1.26
Natural Resources	140	2.86	1.24
Leadership in Agriculture	140	2.90	1.31
Human Relations in Agriculture	137	2.89	1.29
GROUP SUMMARY	(140)	3.12	.81

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ANALYSIS OF NEEDS: EDUCATIONAL PROGRAMS FOR YOUNG AND ADULT FARMERS

A Critique

James Knight, The Ohio State University--Discussant

Introduction

This study was a descriptive study designed to assess the current status of adult education in agriculture and to identify future program development needs in Iowa. This is a fairly traditional kind of study in agricultural education. However, that does not diminish its importance or value. The researcher reports that this is Phase I in a five-phase project.

Significant Findings

This research reports that the farmers studied had a high degree of formal education and generally liked their programs. However, the most significant finding relates to the curriculum for farmers. They placed a high priority on programs in marketing, credit and financial planning. Note that these items are not production skills.

Strengths

The scope of this study (n=300) represents a strength. Even though the response rate was relatively low at 52%, the researcher followed-up a sample of non-respondents to check for non-response bias. A panel of experts were involved in the questionnaire development. It would appear that the design and operation of this study was solid. The recommendations made for this study are provocative, interesting and appropriate. The implications on curricular offerings for young- and adult-farmer programs is significant.

Recommendations

The major question that comes to mind when reviewing this study relates to data analysis. While what was done was appropriate, why didn't the researcher correlate the demographics with the topic areas to see if they explained any of the variability in the areas?

ANXIETIES OF AGRICULTURAL EDUCATION MAJORS PRIOR TO AND IMMEDIATELY FOLLOWING THE STUDENT TEACHING EXPERIENCE

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INTRODUCTION

Several studies have been conducted regarding vocational agriculture instructor morale and the reasons why teachers leave or remain in the profession. Fewer studies have been reported that look at the satisfactions and/or anxieties of students enrolled in the preservice component of teacher education.

As far back as 1965, Robert Bills, then Dean of the School of Education at the University of Alabama brought forth some penetrating issues about student teaching. Bills suggested that "...the key to successful student teaching experiences is to provide an atmosphere free from threat; an atmosphere conducive to changes in behavior; one in which the prospective teacher is aware of the need to change."

Hillison (1977) reported that concerns of agricultural education students change as they progress through their teacher education program. He reported that agricultural education majors beginning their student teaching experience had the highest level of concern than at any time other than the initial freshman year adjustment period. The concerns expressed by student teachers were "self concerns" (44%) and "task concerns" (36%) moreso than "non-teaching" or "impact concerns".

Kirts and Claycomb (1981) studied the characteristics of student teaching programs on a national scale. They revealed that management of student teaching varied widely among teacher training institutions. However, they studied the procedural aspects of the clinical experience without identifying critical experiences or anxieties that affect the student teacher.

Silvernail and Costello (1983) used the Teacher Anxiety Scale (TCHAS) to determine areas of both high and low anxiety for college students enrolled in student teaching and/or educational internship programs. Their report in the Journal of Teacher Education suggested that more extensive student teaching, internship or early experience programs would help reduce teaching anxiety and center student focus on the teacher preparation program.

The primary purpose of this study was to identify the major area of teaching anxiety of students enrolled in agricultural education in seven Mid-western universities. Data for this study was collected from students enrolled in student teaching courses during the semesters and/or quarters within the time frame of January, 1984 to May, 1985. Analysis of data was completed during Fall semester, 1985.

PURPOSE AND OBJECTIVES

The primary purpose of this study was to identify anxiety levels of agricultural education majors associated with selected teaching competencies both prior to and immediately following their student teaching experience. The specific objectives were to:

1. Determine teaching activities causing both high and low anxiety levels prior to and immediately following student teaching.

2. Determine if differences exists between mean pre-student teaching anxiety levels and mean post-student teacher anxiety levels of selected teaching activities.

3. Compare mean pre-student teaching and post-student teaching anxiety levels of selected teaching activities by grade point average.

4. Compare mean pre-student teaching and post-student teaching anxiety levels of selected student teaching activities by type of student teaching format (semester or quarter).

5. Distinguish between mean pre-student teaching and post-student teaching anxiety levels of agricultural education majors by state.

PROCEDURES

The population for this study consisted of agricultural education majors from seven Midwestern Land Grant universities. The sample included those majors conducting their student teaching experience in quarters and/or semesters from January, 1984 to May, 1985. University staff responsible for coordination of student teaching in agricultural education from Kansas State University, Iowa State University, South Dakota State University, University of Missouri, University of Minnesota, North Dakota State University, and the University of Nebraska were the primary contact persons for the collection of data.

Data was collected through the use of a questionnaire administered to agricultural education majors as a pre-test immediately prior to leaving for their student teaching assignments and again as a post-test immediately following their student teaching assignments. The items included in the survey included twenty (20) specific educational activities or competencies taken from a similar study reported in Phi Delta Kappan (December, 1978) and five (5) specific vocational agriculture teaching activities.

Respondents were asked to respond to the survey by placing a 1 to 5 rating for each item indicating the degree of anxiety they felt prior to (pre-test) and during (post-test) student teaching. The scale values and corresponding descriptions were as follows:

Descriptions for scale values for perceived anxiety
1 = No apprehensions; I don't expect any problem at all during student teaching
2 = Little apprehension; concerned, but not enough to really worry about
3 = Some apprehension; but can probably handle in the normal flow of student teaching activity
4 = Fairly apprehensive; this is a definite concern that will require some extra effort during student teaching
5 = Very apprehensive; this is a major concern and I don't know exactly how I'll handle this during student teaching

Descriptions for scale values for actual anxiety
1 = No apprehension; did not have any problem at all during student teaching in this area
2 = Little apprehension; some concern, but not enough to really worry about
3 = Some apprehension; some concern, but it was handled in the normal flow of student teaching activity
4 = Fairly apprehensive; presented a definite concern and required some extra effort during student teaching
5 = Very apprehensive; this was a major concern and I had a difficult time with this during student teaching

The pre-test measured perceived or "anticipated" anxieties, while the post-test measured "actual" anxieties experienced during student teaching. Agricultural education majors student teaching during a quarter or a semester between January, 1984 and May, 1985 were considered the sample for collecting data. Only respondents completing both the pre- and post- student teaching surveys were included as data. A total of 198 paired responses were used in this study.

ANALYSIS OF DATA

Data collected from respondents in this study were analyzed using means and frequencies. Analysis of Variance and T-Tests were used to determine if differences existed among group means. Tukey post-hoc tests were used to determine where actual differences existed (alpha = .05). A Cronbach Alpha reliability coefficient of .8456 was calculated for the entire survey instrument. Mean differences were calculated to determine which competencies possessed the greatest variability between perceived and actual anxiety levels.

RESULTS

The more important findings revealed through analysis of data collected in this study are described by objective.

Objective #1: Determine teaching activities causing both high and low anxiety levels prior to and during student teaching.

The ten teaching activities with the highest anxiety scores experienced prior to student teaching were:

a. Teaching young and adult farmers (3.25)
b. Being a successful teacher (2.91)
c. Being knowledgeable in subject matter (2.88)
d. Motivating students (2.72)
e. Teaching agricultural mechanics (2.71)
f. Handling student discipline (2.71)
g. Lack of student learning (2.63)
h. Conveying subject matter (2.59)
i. Finding a teaching job (2.58)
j. Lack of clarity in presentation (2.54)

The ten teaching activities with the highest anxiety scores experienced during student teaching were:

a. Teaching young and adult farmers (2.50)
b. Motivating students (2.46)
c. Finding a job (2.37)
d. Being knowledgeable in subject matter (2.30)
e. Handling student discipline (2.28)
f. Lack of student learning (2.27)
g. Being a successful teacher (2.26)
h. Teaching agricultural mechanics (2.20)
i. Lack of clarity in presentation (2.13)
j. Conveying subject matter (2.10)

The ten teaching activities with the lowest anxiety scores experienced prior to student teaching were:

a. Elimination of prejudices (1.74)
b. Stage freight in front of class (2.07)
c. Communicating with students (2.08)
d. Supervising SOE programs (2.08)
e. Understanding student attitudes (2.13)
f. Being sensitive to student needs (2.15)
g. Grading students (2.20)
h. Supervising FFA activities (2.21)
i. Dealing with students' parents (2.25)
j. Having good student rapport (2.30)

The ten teaching activities having the lowest anxiety scores experienced after student teaching were:

a. Stage freight in front of class (1.53)
b. Having good student rapport (1.68)
c. Communicating with students (1.68)
d. Eliminating prejudices (1.74)
e. Gaining respect from other teachers (1.78)
f. Supervising SOE programs (1.80)
g. Supervising FFA activities (1.83)
h. Gaining administrative support (1.84)
i. Being sensitive to student needs (1.85)
j. Dealing with students' parents (1.87)

Objective #2: Determine if differences exist between mean pre-student teaching anxiety levels and post-student teaching anxiety levels of selected teaching activities.

On all twenty-five (25) teaching activities included in the study, respondents rated their perceived anxieties (pre-test) higher than they rated their actual anxieties (post-test). Eight (8) teaching activities had significant mean differences (alpha = .05) indicating a statistical difference existed between perceived and actual anxiety scores for those items. Those teaching activities were:

a. Teaching young and adult farmers
b. Being a successful teacher
c. Having good student rapport
d. Gaining respect from teachers
e. Gaining respect from students
f. Being knowledgeable in subject matter
g. Stage freight in front of the class
h. Teaching agricultural mechanics

Objective #3: Compare mean pre-student teaching anxiety levels and post-student teaching anxiety levels by grade point average.

Those agricultural education majors with lower GPA's (2.0-2.49) had lowest perceived anxiety scores on 14 of the 25 teaching activities. Those students with higher GPA's (3.5-4.0) had the highest perceived anxiety scores on 12 of the 25 teaching activities. It was observed that only one of the 25 teaching activities had a significantly different perceived anxiety score when compared by GPA. Students with a GPA of 3.5 - 4.0 had a significantly higher perceived anxiety score than those students with a GPA of 2.0 - 2.49 on "Motivating students" (3.10 and 2,24 respectively).

When actual anxieties experienced during student teaching was compared by GPA, it was observed that students with the lowest GPAs had lowest anxiety scores on 14 of the 25 teaching activities, while students with highest GPAs had highest anxiety scores on 12 of 25 teaching activities. Only one teaching activity had mean actual anxiety scores significantly different (alpha = .01). Students with a GPA of 3.5 - 4.0 experienced higher anxiety (3.19) than did students with a GPA of 2.0 - 2.49 in the area of teaching agricultural mechanics.

Objective #4: Compare mean pre-student teaching and post-student teaching anxiety scores of selected teaching activities by type of student teaching format (semester or quarter).

There were no differences in anxiety levels between respondents completing student teaching through a semester format and those completing student teaching through a quarter format for both perceived (pre-test) and actual (post-test) activities. It was observed that the composite means (all teaching activities) for perceived anxieties were identical (2.43) for both semester and quarter formats. Composite means for actual anxieties experienced during student teaching was also extremely close (quarter = 2.05 and semester = 2.01).

Objective #5: Distinguish between mean pre-student teaching and post-student teaching anxiety scores of agricultural education majors by participating state.

When anxiety levels were compared by respondents from the seven participating states, 12 of the 25 perceived anxiety scores (pre-test) and 10 of the 25 actual anxiety scores (post-test), had significant differences at either the .05 or .01 level. It was observed that some states consistently rated teaching activities with either high or low anxiety scores. For perceived anxiety (pre-student teaching), one state had the lowest ratings on 16 of the 25 activities, while two other states had the highest perceived anxiety ratings on 17 of the 25 activities.

It was also observed that one of the seven states had the lowest actual (post-student teaching) scores on 15 of the 25 teaching activities, while another state had the highest actual anxiety ratings on 14 of the 25 teaching activities. While no specific state data will be reported, all information pertaining to participating Agricultural Education Departments will be shared so that the information may be used to evaluate their respective teacher preparation program.

CONCLUSIONS AND RECOMMENDATIONS

Several conclusions and recommendations can be made from the results of this study.

1. In every case, the anxieties experienced by agricultural education major were higher prior to student teaching than during the actual student teaching experience. Therefore, it is recommended that agricultural education majors participate in an early experience program designed to address those factors of highest anxiety, especially in the areas of adult education, agricultural mechanics, motivating students, and handling discipline.

2. The activities identified by the 198 respondents in this study as contributing most to their student teaching anxieties were very similar to those reported by Silvernail and Costello (1983) for both highest and lowest anxiety levels.

3. The area of teaching young and adult farmers received the highest anxiety rating both prior to and during student teaching. It is recommended that more extensive preservice coverage of adult and continuing education be provided, including a practicum in teaching adult classes if possible.

4. Students with higher grade point averages (3.5-4.0) tend to have higher anxiety levels on both perceived and actual student teaching activities. It was also observed that agricultural education majors with lower GPA (2.0-2.49) exhibited lower anxiety on both perceived and actual student teaching activities. This finding was found to be especially true in the apprehensions regarding teaching agricultural mechanics. This data must be interpreted carefully. Perhaps high GPA students are naturally more anxious and concerned with achievement and performance. Therefore, the possibility of these students being successful teachers might be at least as good, if not more so, than students experiencing less anxiety.

It is recommended that student teachers at all GPA levels be informed of the exact expectations, procedures to be followed, and grading criteria to be used during student teaching, and be placed in the least threatening student teaching environment possible. An early experience or internship program (as prescribed by Silvernail and Costello) may help alleviate the differences in anxiety due to GPA 5. When student teachers' anxiety levels were compared by participating state, approximately half of all teaching activities had significantly different mean anxiety levels. In addition, respondents from certain states exhibited a tendency to rate teaching activities either high throughout the entire survey, or low throughout the entire survey. It is recommended that each state review the data for their participants and interpret the data according to ongoing preservice policy and practices in their respective departments. It is further recommended that the practices and policies of each states' programs leading to lower anxiety levels be reviewed and shared with other participating agricultural education programs.

6. It was concluded that whether a student teacher was enrolled in a semester or a quarter-long experience did not effect their mean anxiety levels on any of the 25 teaching activities. The findings from this study are equally valid for agricultural education majors regardless of the student teaching format.

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ANXIETIES OF AGRICULTURAL EDUCATION MAJORS PRIOR TO AND IMMEDIATELY FOLLOWING THE STUDENT TEACHING EXPERIENCE

A CRITIQUE

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This study analyzed anxieties associated with the student teaching experience. Data were collected from agricultural education students in seven Midwestern universities over a 17 month period. Students' anxieties were measured prior to and following student teaching using a 25-item instrument.

Strengths

1. This study addresses a current concern of teacher educators nationwide and provides a base for additional study.

2. The investigator is commended for cooperating with other universities in conducting the study over several semesters or quarters. In addition to the gains realized from the study, the opportunities for continued communication and cooperation among the universities are enhanced.

3. Objectives of the study are clearly stated and results are presented under each objective in a concise, effective manner. The format used by the investigator maximizes the information shared.

4. Procedures used in conducting and analyzing the study are adequately explained. A detailed description of the scales used in the study is provided.

5. Conclusions and recommendations are well stated and are consistent with the findings reported.

Weaknesses

1. Although the total number of paired responses is reported, there is no indication of the total number of individuals completing student teaching during the time covered in the study. The response percentage needs to be reported.

2. The researcher does not refer back to the description of the scales used in the findings or in the conclusions and recommendations. Mean scores do not mean anything unless they are related back to the scales used in the instrument. For example, the teaching activity with the highest anxiety score prior to student teaching had a mean score of 3.25 on the 5-point scale. Using the descriptors, a "2" represents "little apprehension" while a "3" represents "some apprehension"; therefore based on the descriptors, how apprehensive are students prior to the student teaching experience?

3. There are significant differences among states in anxiety levels for about half of the teaching activities, yet no information was presented which helps teacher educators to understand these differences. Could insight into understanding these differences be made without identifying institutions by name? A recommendation for further study would seem appropriate.

ASSESSING NEEDS AND PLANNING INSERVICE EDUCATION FOR FIRST-YEAR VOCATIONAL AGRICULTURE TEACHERS

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INTRODUCTION

One purpose of needs assessment is to build a foundation for providing inservice education. The strength of an inservice workshop and the follow-up evaluation depends upon planning, and planning depends upon needs assessment. The collection of information is fundamental in meeting the participants' needs and developing effective workshops. "A sound needs assessment procedure will assist staff development leaders in establishing priorities and designing activities" (Lentz, 1983, p. 35).

Landrith (1977) viewed needs assessment as an objective evaluation of the strengths and weaknesses of individuals, whereas Witkin (as cited by Lentz, 1983) viewed needs assessment as the kinds and degrees of discrepancy that exist between a desired state of affairs and the present conditions (p. 35). The needs assessment must allow the participants to appraise present conditions and suggest alternatives. The assessment statements are to establish real needs that can be fulfilled. "The contrast is between the satisfactory and the unsatisfactory; between what respondents have and what they need to do their jobs better" (p. 36).

A needs assessment model presented by Borich (cited in Barrick, Ladewig & Hedges, 1983) was based upon existence of a difference between "what is" and "what should be" (p. 13). "Borich (cited in Barrick, et al., 1983) maintains that a training program can apply the model by defining 'what is' as the measured behaviors, skills and the competencies of the trainee and 'what should be' as the goals of the program" (p. 13). Differences between "what is" and "what should be" can then be used as a measure of the needs.

New teachers of vocational agriculture in Ohio who enter the teaching profession without a degree in agricultural education participate in a four-week intensive professional education workshop. During the first year of teaching, the new teachers receive on-site supervision from teacher educators, and they attend a follow-up workshop during the summer after the first year. The content of the first workshop is based upon a list of 26 instructional topics identified by the Ohio Department of Education, Division of Vocational Education, as essential for the professional preparation program of teachers recruited from business and industry. The content of the second workshop and the needs to be addressed during the on-site supervision should be determined, based on those 26 topics.

PURPOSE AND OBJECTIVES

The purpose of the study was to identify the inservice needs of first-year vocational agriculture teachers who were enrolled in the special preparation program. The objectives were to:

1. Determine the perceptions of the teachers regarding the importance of the 26 topics to their teaching.

2. Determine the perceptions of the teachers regarding their knowledge of the 26 topics.

3. Determine the priorities of the teachers for further inservice education on the 26 topics.

PROCEDURES

This study was part of a larger study conducted by the principal investigator that included teachers in all vocational areas. The population for the portion reported in this paper was all first-year vocational agriculture teachers in Ohio who attended the four-week intensive professional education workshop in 1984 or 1985. Twenty-five teachers were in the study.

Data were collected using an instrument designed by the researchers. Respondents indicated their perceptions of the importance of the topic and their knowledge of the topic for all 26 topics on a scale of 1 (low) to 5 (high). Using the Borich Model, weighted discrepancy scores were computed by subtracting the knowledge score from the importance score and multiplying the difference times the importance score. The instrument was assessed to be reliable based on Cronbach's alpha of .87.

Instruments were mailed in January of 1985 and 1986 to the teachers. A 100% response rate was achieved after two mailings and a follow-up telephone call.

ANALYSIS OF DATA

Mean scores for each topic for each year were calculated for the 26 topics on the importance rating and the knowledge rating. Weighted discrepancy scores were computed for the 26 topics for each year. The topics were then rank-ordered, based on the weighted discrepancy scores. A larger difference between importance and knowledge times a higher importance rating would yield a higher needs ranking on the weighted score rank.

RESULTS

Importance scores ranged from 3.18 to 4.73 (on the 5-point scale) in 1984 and from 3.50 to 4.86 for the 1985 group. Topics rated highest in importance included Managing student behavior, Teaching safety and Obtaining a teaching certificate in 1984, and Managing student behavior, Motivating students and Managing student learning in the laboratory for the 1985 group.

Topics rated lowest in importance by the 1984 group were Writing behavioral objectives, Personalizing a vocational philosophy and Writing duties and task statements. For the 1985 group, lowest ranking topics were Advising the vocational student organization, Personsalizing a vocational philosophy, Writing behavioral objectives and Being aware of sex equity. Refer to Table 1.

Table 1

Perceived Importance of Topics

	1984 n=11		1985 n=14	
Instructional Topics	Mean	S.D.	Mean	S.D.
Motivating students.	4.55	1.21	4.86	0.36
Managing student behavior.	4.73	0.65	4.86	0.36
Managing student learning in the lab.	4.55	0.82	4.86	0.36
Understanding teacher liability.	4.55	0.93	4.57	0.65
Managing student learning in the classroom.	4.55	0.69	4.71	0.61
Planning instructional strategies.	4.00	1.00	4.43	0.76
Dealing with student individual differences.	4.55	0.93	4.64	0.63
Working with disadvantaged students.	4.09	1.04	4.50	0.52
Writing a course outline.	4.36	0.67	4.64	0.74
Working with handicapped students.	4.09	1.04	4.29	0.83
Advising the vocational student organization.	3.64	1.21	3.50	1.09
Preparing and using instructional sheets, job sheets and/or task sheets.	4.55	0.52	3.93	0.92
Preparing teaching materials.	4.18	0.87	4.69	0.48
Understanding the principles of teaching and learning.	4.27	1.19	4.36	0.74
Preparing lesson plans.	4.18	0.60	4.71	0.47
Employing public relations principles.	3.91	1.58	4.43	0.76
Working within the school system.	4.45	0.69	4.29	0.73
Using advisory committees.	4.00	0.63	3.86	1.17
Writing duties and task statements.	3.45	1.21	3.93	1.07
Teaching safety.	4.64	0.67	4.79	0.58
Obtaining a teaching certificate.	4.64	0.50	4.57	0.76
Writing behavioral objectives.	3.18	1.47	3.57	1.09
Personalizing a vocational philosophy.	3.36	1.36	3.57	1.22
Understanding the role of a teacher.	4.09	0.94	3.86	0.77
Becoming involved in professional organizations.	3.64	1.29	3.71	1.14
Being aware of sex equity.	4.18	0.75	3.57	1.02

Knowledge scores ranged from 2.73 to 4.18 for the 1984 group and from 2.21 to 4.29 for the 1985 group. Highest rated knowledge topics for the 1984 group were Teaching safety, Obtaining a teaching certificate and Preparing teaching materials. For the 1985 group, highest rated topics were Teaching safety, Obtaining a teaching certificate and Preparing lesson plans.

Topics rated lowest in knowledge by the 1984 group included Working with disadvantaged students, Working with handicapped students and Personalizing a vocational philosophy. For the 1985 group, topics rated lowest in knowledge were Advising the vocational student organization, Preparing and using task sheets, Motivating students, Managing student behavior and Writing behavioral objectives. Refer to Table 2.

Table 2

Perceived Knowledge of Topics

Instructional Topics	1984 n=11 Mean	1984 n=11 S.D.	1985 n=14 Mean	1985 n=14 S.D.
Motivating students.	3.73	0.79	3.00	1.11
Managing student behavior.	3.27	1.01	3.00	1.11
Managing student learning in the lab.	3.18	0.87	3.29	1.07
Understanding teacher liability.	3.73	1.01	3.07	1.07
Managing student learning in the classroom.	3.36	0.67	3.29	0.83
Planning instructional strategies.	3.27	0.90	3.07	1.07
Dealing with student individual differences.	3.55	0.93	3.29	1.20
Working with disadvantaged students.	2.73	0.79	3.21	1.25
Writing a course outline.	3.36	0.67	3.50	1.09
Working with handicapped students.	2.82	0.87	3.07	1.33
Advising the vocational student organization.	3.00	1.18	2.21	0.80
Preparing and using instructional sheets, job sheets and/or task sheets.	3.82	1.17	2.79	1.05
Preparing teaching materials.	4.00	0.63	3.69	0.95
Understanding the principles of teaching and learning.	3.00	1.10	3.43	0.94
Preparing lesson plans.	3.73	0.47	3.86	0.77
Employing public relations principles.	3.55	1.44	3.64	1.22
Working within the school system.	3.64	0.81	3.64	1.08
Using advisory committees.	3.09	1.22	3.23	1.24
Writing duties and task statements.	3.45	0.82	3.38	0.77
Teaching safety.	4.18	0.75	4.29	0.47
Obtaining a teaching certificate.	4.09	0.70	4.08	1.04
Writing behavioral objectives.	3.09	1.22	3.00	1.04
Personalizing a vocational philosophy.	2.90	1.20	3.36	0.84
Understanding the role of a teacher.	3.60	1.35	3.57	1.02
Becoming involved in professional associations.	3.36	1.21	3.64	1.15
Being aware of sex equity.	3.64	1.12	3.71	1.14

The weighted discrepancy scores were used to rank the topics on the basis of importance and knowledge considered simultaneously. The top three topics on the 1984 ranking included Managing student behavior, Managing student learning in the lab, and Working with disadvantaged students. The lowest three topics were Writing duties and tasks statements, Writing behavioral objectives and Preparing teaching materials. The top three topics on the 1985 ranking were Motivating students, Managing student behavior and Managing student learning in the lab. The lowest three topics were Being aware of sex equity, Being involved in professional associations, and Understanding the role of the teacher. Refer to Table 3.

Table 3

Ranks of Weighted Importance and Knowledge Scores for Topics

Instructional Topics	1984 n=11		1985 n=14	
	Mean	S.D.	Mean	S.D.
Motivating students.	4.82	4.73	9.29	6.46
Managing student behavior.	7.27	6.07	9.00	5.14
Managing student learning in the lab.	6.36	3.72	7.71	5.54
Understanding teacher liability.	4.00	4.36	7.50	7.09
Managing student learning in the classroom.	5.64	3.88	7.14	5.07
Planning instructional strategies.	3.27	3.58	6.64	6.22
Dealing with student individual differences.	4.82	3.89	6.57	6.48
Working with disadvantaged students.	6.18	4.62	5.86	5.72
Writing a course outline.	4.82	5.02	5.71	6.16
Working with handicapped students.	5.73	4.45	5.43	5.84
Advising the vocational student organization.	2.55	2.54	5.29	4.41
Preparing and using instructional sheets, job sheets and/or task sheets.	3.45	5.92	5.21	5.59
Preparing teaching materials.	1.18	3.09	4.77	4.59
Understanding the principles of teaching and learning.	6.09	5.61	4.50	5.35
Preparing lesson plans.	2.27	3.66	4.14	3.84
Employing public relations principles.	1.91	3.88	4.07	6.45
Working within the school system.	3.73	2.94	2.93	3.65
Using advisory committees.	3.55	3.62	2.92	3.40
Writing duties and task statements.	0.82	2.96	2.92	4.52
Teaching safety.	2.45	4.39	2.64	2.92
Obtaining a teaching certificate.	2.82	4.51	2.46	5.30
Writing behavioral objectives.	0.91	3.59	2.43	3.48
Personalizing a vocational philosophy.	1.70	2.21	1.64	4.01
Understanding the role of a teacher.	2.10	3.96	1.29	3.56
Becoming involved in professional organizations.	1.27	2.53	0.71	3.79
Being aware of sex equity.	2.73	6.33	0.29	5.84

CONCLUSIONS AND RECOMMENDATIONS

Based on the data, the following conclusions and recommendations are presented.

1. Student management techniques are rated as important to first-year teachers. Additional attention should be given to management topics during the intensive workshop.

2. Student organization advising is rated low in knowledge by teachers. However, the topic is not rated as high in importance. This topic (and others rated similarly) could be addressed at later times in the professional preparation program.

3. Although teachers did not rate them high on importance, the low ratings on knowledge indicated the topics such as working with disadvantaged and handicapped students should be addressed more adequately during some portion of the program.

4. Teachers identified the topics that are the highest concern for them, based on the weighted rankings. Teacher educators should address those concerns during on-site supervision. Those topics should also be included in the follow-up workshop.

5. Findings in this study are limited to a select group of first-year teachers. Those first-year teachers who hold a degree in agricultural education should be included in future studies to determine their needs and to compare the two groups.

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ASSESSING NEEDS AND PLANNING INSERVICE EDUCATION FOR FIRST-YEAR VOCATIONAL AGRICULTURE TEACHERS
A CRITIQUE

Richard I. Carter, Iowa State University--Discussant

The investigators used assessment techniques to evaluate instructional topics identified by the Ohio State Department and to set priorities for workshops designed for teachers without a degree in agricultural education. Teachers' perceptions of the importance and their knowledge of each topic were ascertained and weighted scores were calculated for each topic.

Strengths

1. Evaluation was tied directly to established instructional topics identified by the State Department as essential for the professional preparation program of teachers recruited from business and industry. Purposes and objectives were clearly established.

2. Assessment techniques incorporated in the study were previously used in other research projects.

3. The population was identified and a response rate of 100 percent was obtained which was important considering the number surveyed.

4. The reliability of the instrument was reported and the alpha level was adequate to conclude that it was a consistent measure.

Weaknesses

1. Explanation of the procedures used in determining the discrepancy scores need to be further clarified in the paper. Were discrepency scores calculated from raw scores for each individual or from the mean scores for each group?

2. It is difficult to make decisions using the data as presented. Would there be merit in combining the two years of data for the purpose of setting priorities? If not, then a more thorough job of reporting and contrasting the perceptions of the two groups is needed.

3. Table 3 is entitled, "Ranks of Weighted Importance and Knowledge Scores for Topics", although discrepency scores are listed and no ranks are provided in the table. A priority listing of the 26 topics (objective 3) is not summarized and included in the paper.

4. Conclusions and recommendations drawn by the investigators were based on partial interpretation of the results. For example, it was reported that the topic, "student organization advising", is rated low in knowledge by teachers and not rated as high (as other topics) in importance; yet, for the 1985 group of teachers, this topic had a discrepency score higher than over half of the other topics. Overall, the conclusions and recommendations section could be strengthened by better utilization of the data presented.

ASSESSMENT OF THE USE OF MICROCOMPUTERS IN NORTH DAKOTA SECONDARY VOCATIONAL AGRICULTURE DEPARTMENTS

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INTRODUCTION

The use of microcomputers in vocational agriculture departments in North Dakota was believed to have been increasing over the few years just prior to this study. The teachers had participated in classes or other inservice activities; relied on their own innovative teaching methods; taught themselves; and shared experiences with other vocational agriculture teachers to try to effectively use the microcomputer. Research had been lacking which would have provided information about what successful microcomputer activities had been used in North Dakota vocational agriculture instruction.

Related Literature

The number of microcomputers found in public school systems had increased dramatically over a period of a few years. In 1984, a market research group estimated the number of microcomputers in schools to be 500,000 (Komoski, 1984).

Malpiedi and others (1985) concluded that the availability of microcomputers in vocational agriculture departments was the exception, not the trend. A survey by the National FFA Organization (1985) indicated that 51 percent of the vocational agriculture departments in the United States had computers during the 1984-85 school year. In that same survey, the North Dakota state supervisor for vocational agriculture reported that 80 percent of the vocational agriculture departments in North Dakota had computers.

Microcomputers were most frequently being used in financial areas such as farm management and record keeping. Oregon, Idaho, and Washington teachers rated financial analysis program topics as being the most valuable (Church and Foster, 1984). In Ohio, farm management accounting programs were the most frequent type of program found in vocational agriculture departments (Malpiede, et al., 1985).

A vocational agriculture teacher's background in using microcomputers plays a key role in implementing the use of microcomputers in instructional programs. Teachers surveyed in Nebraska and Iowa felt they had average or less than average microcomputer user knowledge for agricultural areas (Foster and Miller, 1985). Passmore (1983) listed the lack of teacher training on microcomputers as a limiting factor to using computers in education. Ratcliff (1985) felt that many vocational agriculture teachers had apprehensions when using microcomputers.

PURPOSE AND OBJECTIVES

This study was conducted to gather information on the computer background of the vocational agriculture teachers, what hardware and software existed in the vocational agriculture departments, and how effective teachers perceived microcomputers to be in their instructional programs.

The specific objectives of this study were:

1. To determine the preparation and experiences of vocational agriculture teachers which contribute toward their competence in using microcomputers.
2. To determine the extent of microcomputer hardware and software inventory available for use by vocational agriculture teachers.
3. To determine in which units of instruction microcomputers were being used by vocational agriculture teachers for instructional purposes.
4. To determine the effectiveness, as perceived by the teachers, of incorporating microcomputers as an educational tool in the vocational agriculture instructional program.
5. To determine the kind of use vocational agriculture teachers and students make of the microcomputer outside the instructional program such as management of grades, test generating, and correspondence.

PROCEDURES

A questionnaire was developed by the researcher with the assistance of his major advisor. Parts of the questionnaire were adapted from surveys developed by Church and Foster (1984) and Foster and Miller (1985). A panel of experts was selected to review the instrument. The instrument was subsequently pilot tested with a small group of former vocational agriculture teachers and a group of senior agricultural education students. After pilot testing and making minor revisions, the questionnaires were mailed to each North Dakota secondary vocational agriculture teachers in February, 1985. The population consisted of 89 individuals representing 91 teaching positions and 81 different departments. Two mailings and a reminder letter were used resulting in a 100 percent response by the teachers. Telephone calls and personal contact were used to clarify information. All questionnaires were usable after the information was clarified.

The questionnaire consisted of four parts: (1) microcomputer background of the teacher, (2) inventory of microcomputer hardware and software in the department, (3) uses of microcomputers for instructional purposes, and (4) uses of microcomputers for instructional management and departmental tasks. Part III and Part IV included the amount of time the microcomputer was used, the perceived effectiveness of the microcomputer, and the reason that it may have not been used. If microcomputers were not used in the program, Part III and/or Part IV were not completed.

ANALYSIS OF DATA

Data were collected from the entire population of the North Dakota vocational agriculture teachers. Because a 100 percent usable return rate was achieved, neither sampling procedures nor adjustments were necessary to describe the population.

Data collected were entered on the North Dakota State University computer system and analyzed using the Statistical Analysis System (SAS). Frequencies were tabulated for all data. Mean scores were determined for teachers' proficiency in the operation of microcomputer programs and perceived effectiveness of using the microcomputers. This was simply a descriptive study therefore no other statistical procedures were used. Reliability coefficients (Cronbach's alpha) of .81 were calculated for appropriate sections of the instrument.

RESULTS

Background and Experience of Teachers

Data were collected in five areas concerning teacher's microcomputer background and experience. These areas were: (1) years of experience, (2) type of microcomputer training, (3) frequency of current use of microcomputers by teachers, (4) degree of comfort felt when using the microcomputer, and (5) proficiency of operating various types of microcomputer programs.

As indicated by the data in Table 1, the largest group of teachers fell into the "one but less than two years of experience" category. This group of 32 teachers represented 35.96 percent of the 89 North Dakota secondary vocational agriculture teachers. Six teachers indicated that they had no previous microcomputer experience. The use of microcomputers was relatively new as 70.79 percent of the teachers had less than two years experience using them. Forty-seven teachers (52.81 percent) indicated they received their microcomputer training through graduate level classes.

Table 1 also reveals the frequency of which the teachers used a microcomputer and their degree of comfort using it. The largest group of teachers, 34.83 percent, indicated they used the microcomputer less than once a day but at least once a week. Twenty-two teachers (24.72 percent) used the microcomputer on a daily basis. These two groups combined revealed that more than half (59.96 percent) of the teachers used the microcomputers every week. Most teachers indicated they felt comfortable using microcomputers. Fifty-one or 57.96 percent were in this group. Those feeling uncomfortable or very uncomfortable constituted 25.00 percent of the teachers.

Teachers were asked to rate their proficiency of operating various types of programs on a Likert scale where values were assigned as follows: have not used = 0, have used but not proficient = 1, somewhat proficient = 2, and very proficient = 3. Mean scores indicated that teachers were most proficient at games or tutorial programs with a mean score of 1.75. This was followed by use of decision aid programs (1.61), teacher utility programs (1.40), farm analysis programs (1.35) word processing (1.30), electronic spreadsheets (1.13) and data filing systems (1.06).

Table 1

Background of Vocational Agriculture Teachers in Using Microcomputers

Variable	Number	Percent
Years of Experience:		
No experience	6	6.74
Less than one year	25	28.09
One but less than two years	32	35.96
Two to three years	19	21.35
More than three years	7	7.86
Type of Training:		
Graduate level Classes	47	52.81
Inservice workshops	32	35.96
College classes	27	30.34
Personal Experience only	17	19.10
No training	2	2.25
Other	3	3.37
Frequency of use:		
At least once a day	22	24.72
Less than once a day but at least once a week	31	34.83
Less than once a week but at least once a month	11	12.36
Less than once a month but do use it sometimes	16	17.98
Do not use the microcomputer at all	9	10.11
Degree of confidence when operating:		
Very comfortable	15	17.04
Comfortable	51	57.96
Uncomfortable	18	20.46
Very uncomfortable	4	4.54

Inventory of Microcomputer Hardware and Software

Apple computers were the predominant microcomputer in North Dakota vocational agriculture departments. There were 58 departments (71.60 percent) with one or more Apple computers. One department had IBM computers, two had Radio Shack, and one had another brand of computer. While 22 schools (27.16 percent) did not have a microcomputer in the vocational agriculture department, all schools had microcomputers in the school. Two teachers (2.47 percent) indicated that microcomputers were not available for instructional use, although their schools did have them.

Teachers were asked to report what microcomputer peripherals were available in their department. Fifty-four (66.67 percent) of the departments had printers. There were 51 departments (62.96 percent) with one or more extra disk drives. Other peripherals were less common. Ten teachers indicated having telephone modems; six reported having a numeric pad; one responded as having joy sticks; and one teacher indicated having other equipment.

Table 2

Microcomputer Software in N. Dakota Vocational Agriculture Departments

Types of software	n[a]	percent
Decision aid programs	57	70.37
Electronic spreadsheets	53	65.43
Farm analysis programs	52	64.20
Word processing programs	48	59.26
Teacher utility programs	45	55.56
Tutorial programs	43	53.09
Games	42	51.85
Data filing systems	28	34.57

[a]The total number is greater than the number of departments because some departments had more than one type of software.

Decision aid programs were the most common type of software found in vocational agriculture departments, as reported in Table 2. Fifty-seven of the 81 departments (70.37 percent) had this type of software. More than half the departments had the following types of software: electronic spreadsheets (65.43 percent), farm analysis programs (64.20 percent), word processing (59.26 percent), teacher utility programs (51.85 percent), tutorial programs (53.09 percent), and game programs (51.85 percent).

Use of Microcomputers in Instructional Programs

To determine in which instructional units microcomputers were used, a list of units was drawn from the Course of Study Guide for Vocational Agriculture/ Agribusiness in North Dakota (Luft and Backlund, 1980). Sixty of the 91 teachers reported using microcomputers in at least one instructional unit. Table 3 indicates the number of teachers who used the computer in each unit, the percent of all 91 teachers, and percent of the 60 teachers designated as "users" of microcomputers in their instructional program. Table 3 also indicates the effectiveness of the microcomputers in the instructional units as perceived by the teachers.

Fifty-one teachers, or 85.00 percent of microcomputer users for instructional programs, used them for farm business management. This was followed by supervised occupational experience and animal nutrition, both with 32 teachers (53.33 percent of users) using microcomputers in these units. FFA leadership (48.33 percent), advanced crop science (43.33 percent), and small engines (40.00 percent) ranked next. There were six units where five or fewer teachers indicated using microcomputers.

Table 3

Teachers Using Microcomputers for Teaching Instructional Units

Instructional Unit	Number of users[a]	Percent of total (n = 91)	Percent of users (n = 60)	Mean Score of Perceived Effectiveness[b]
Farm Business Management	51	56.04	85.00	4.08
SOEP (classroom)	32	35.16	53.33	3.81
Animal Nutrition	32	35.16	53.33	3.69
FFA Leadership	29	31.87	48.33	3.72
Adv/Crop Science	26	28.57	43.33	3.65
Small Engines	24	26.37	40.00	3.83
Intro/Agribusiness	22	24.18	36.67	3.55
Adv/Animal Science	21	23.08	35.00	3.90
Farm Structures	20	21.98	33.33	3.65
Basic Ag Carpentry	20	21.98	33.33	3.65
Ag Sales and Service	19	20.88	31.67	3.95
Intro/Crop Science	18	19.78	30.00	3.33
Intro/Animal Science	14	15.38	23.33	3.43
Farm Machinery	13	14.29	21.67	3.46
Ag Electricity	12	13.19	20.00	3.67
Tractor Maintenance	12	13.19	20.00	3.67
Intro/Ag Careers	11	12.09	18.33	3.45
Soil Science	11	12.09	18.33	3.36
Ag Welding	10	10.99	16.67	3.60
Soil/Water Engineering	8	8.79	13.33	3.88
Range Management	5	5.49	8.33	3.80
Cold Metal/Soldering	5	5.49	8.33	3.60
Horticulture	5	5.49	8.33	3.20
Meats Processing	3	3.30	5.00	3.00
Tractor Safety	1	1.10	1.67	4.00
Dairy Products	1	1.10	1.67	2.00

[a] Users were teachers using microcomputers for one or more instructional units.
[b] Mean scores were calculated on a Likert scale where very effective = 5, effective = 4, somewhat effective = 3, ineffective = 2, and very ineffective = 1

Effectiveness of Computer Assisted Instruction

The perceived effectiveness of using microcomputers was measured by the teachers' perceptions. It was rated on a Likert scale as very effective = 5, effective = 4, somewhat effective = 3, ineffective = 2, and very ineffective = 1. Mean scores were calculated for each instructional unit (Table 3) using the weighted values.

Farm business management was the highest rated with a mean score of 4.08. This unit also received the highest number of responses. It should be noted that mean scores for units that were rated by a larger number of teachers have more credibility than those rated by fewer teachers.

Microcomputer Use Other Than Computer Assisted Instruction

A list of 15 activities was provided in the questionnaire to determine where microcomputers were used other than for classroom instruction. Sixty teachers were identified as "users" having used computers in at least one area other than computer assisted instruction. Word processing was the most frequently listed type of activity that the teachers performed. Table 4 reveals 40 teachers (66.67 percent of the users) said they used word processing for class materials. Thirty-nine (65.00 percent of the users) used microcomputers for sending correspondence.

Table 4
Teachers Using Microcomputers for Activities Other Than CAI

Area of microcomputer use	Number of Users	Percent of total (n = 91)	Percent of users (n = 60)
Word processing class materials	40	43.96	66.67
Word processing correspondence	39	42.86	65.00
Entertainment	36	39.56	60.00
Test Generation	34	37.36	56.67
Word processing (other)	30	32.97	50.00
Grades management	30	32.97	50.00
Spreadsheet for office use	29	31.87	48.33
SOE record keeping	28	30.77	46.67
Mailing lists	25	27.47	41.67
FFA secretarial activities	22	24.18	36.67
FFA Financial activities	21	23.08	35.00
Creating quizzes and/or puzzles	20	21.98	33.33
Data base management	16	17.58	26.67
Contest tabulations	13	14.29	21.67
SOE awards	6	6.59	10.00

CONCLUSIONS

Based upon the findings of this study, the following conclusions were drawn:

1. The use of microcomputers in North Dakota vocational agriculture programs was relatively new. Most teachers had less than two years experience of using microcomputers; had received some training through college classes, graduate classes, or inservice workshops; and tended to feel comfortable or very comfortable when operating a microcomputer.

2. Nearly all North Dakota vocational agriculture teachers could have used microcomputers within their programs. Most had microcomputers within their departments, others had them available in other departments of the school. Printers and extra disk drives were the most predominant type of microcomputer peripheral available in the departments.

3. Microcomputers were being used in all units of instruction by one or more teachers. They were used most to work decision aids and tutorial programs in such units as farm business management, SOE, animal nutrition, FFA leadership, and advanced crop science.

4. Teachers perceived the use of microcomputers for instructional purposes to be effective. It was identified as being most effective for teaching farm business management, perhaps because of the decision aid programs available.

5. Microcomputers were used by many teachers for non-instructional purposes. Activities which received most frequent microcomputer use included word processing, correspondence, entertainment, and generating tests.

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Assessment Of The Use Of Microcomputers In North Dakota Secondary Vocational Agriculture Departments

A Critique

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The purpose of the study was to gather information on the computer usage characteristics of North Dakota vocational agriculture instructors and determine the current status of hardware and software use and availability to vocational agriculture programs.

Strengths Of The Study

The major strength of this research was having the entire population represented in the study. The data collection instrument was determined to have face validity through jury review prior to administration of the survey. Reliability of the instrument was established using suitable statistical procedures.

The researchers included a variety of user information to provide a comprehensive overview of computer use in a vocational agriculture department. In addition to the usual instructional role of the computer, management uses were investigated as well. The study provides a data base from which futher research and programmatic decisions can be made.

Findings in this study support previsous research in other states across the nation. The study was solely a descriptive look at "what is" and required only descriptive statistical analysis. For its purposes, the study was well planned and conducted.

Areas In Need Of Strengthing

Although the research was completed to determine current status of microcomputing in North Dakota, no recommendations were forthcoming from the research to address any perceived problems or programs in the computer technology area.

The design of the study might have better addressed possible microcomputer-related problems or issues facing North Dakota vocational agriculture instructors. Since vocational educators are problem solvers by nature, research should be designed to solicite possible answers as well as simply collect data.

ATTITUDES HELD BY VOCATIONAL AGRICULTURE TEACHERS TOWARDS FFA PROFICIENCY AWARDS

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INTRODUCTION

FFA proficiency awards have been a part of the FFA awards program since 1944 (Bender & Taylor, 1974). Many agricultural educators continue to support the proficiency awards program for its educational value.

However, a problem appears to exist in this aspect of the high school vocational agriculture program in Louisiana and possibly in other states. For example, less than 15% of the teachers in the state had students to apply for these awards in 1985. In addition, it appears that the same teachers have students to apply for these awards from year to year while most teachers in the state do not participate in this program at all (R. Sullivan, personal communication, May 8, 1985).

A review of the literature revealed that a limited amount of research had been conducted in the area of proficiency awards. In a related study, White and Christiansen (1978) reported in a study of FFA contests that over one-half of the contests entered by schools correlated with the area of teaching interest of the teachers of vocational agriculture for the chapters under their direction.

Ricketts and Newcomb (1984) studied the leadership and personal development abilities possessed by high school seniors who were members of superior and non-superior FFA chapters and by seniors who were never enrolled in vocational agriculture. They reported that chapter activeness had a higher relationship to leadership and personal development abilities possessed by FFA members than activeness at district or regional, state, and national levels.

Drake (1982) may have addressed the main reason why teachers do not have students applying for proficiency awards. He maintains that it is a fantasy to believe that teachers of agriculture can or are willing to carry out the many expectations held for their positions. Drake stated that the super person fantasy may well be the most serious professional problem currently facing agricultural education.

This study was initiated to determine why some Louisiana teachers have students apply for proficiency awards on a regular basis while most teachers never have students to apply. The results of this study should provide the answers needed to improve the proficiency awards program in Louisiana.

PURPOSE AND OBJECTIVES

The purpose of this study was to assess vocational agriculture teachers' attitudes towards the FFA proficiency award program and to determine what factors are related to whether a teacher had students to apply for these awards. The objectives were:

1. Determine the attitudes held by Louisiana vocational agriculture teachers towards the FFA proficiency awards program .

2. Determine if selected factors were predictors of whether a teacher had students to apply for proficiency awards. The factors included years

teaching experience, years vocational agriculture in high school, number of vocational agriculture teachers in the school and percent rural students in the program.

3. Determine if differences existed in teachers attitudes toward the proficiency awards program between those teachers who did have students to apply in 1985 and those who did not.

PROCEDURES

Instrumentation

A questionnaire was developed to secure the information needed for this study. Items for the questionnaire were selected after a thorough review of the literature. The questionnaire was examined for content validity by eight vocational agriculture teachers. The teachers reported that the instrument possessed content validity.

The questionnaire was field tested with fifteen teachers who were not in the sample selected for the study. No modifications were indicated as being necessary by the field test. The instrument that resulted from these procedures included a demographic information section, a 15 item section containing statements pertaining to proficiency awards with responses recorded on a Likert type scale (6 point, Strongly Disagree = 1, Strongly Agree = 6), and a 12 pair, 7 point semantic differential scale.

Reliability estimates were calculated for the two scales of the questionnaire using Cronbach's Alpha, yielding the following estimates: Attitudes towards proficiency awards - $r = .89$, and the semantic differential scale - $r = .92$. These data indicated that the instrument possessed internal consistency.

Populations and Sample

The two populations used in the study included all vocational agriculture teachers in Louisiana who did or did not have students to apply for FFA proficiency awards during 1985. The year 1985 was used because this was the only year for which an accurate listing of applications was available.

All 39 teachers who had students to apply for FFA proficiency awards were surveyed and 100% responded. This list was secured from the State Supervisor of Vocational Agriculture programs.

A sample of 126 teachers out of the 235 teachers who did not have students to apply were randomly selected based on Cochran's formula (Snedecor and Cochran, 1980). A total of 106 teachers responded after two mailings and a phone follow-up for a response rate of 84.1%. Inferential t-tests (Alpha = .01) were used to determine if differences existed between the mail and phone responses to the Likert and semantic differential scale items. Since no differences existed, the data were combined for analysis. As a result of these procedures, it was determined that the respondents were representative of the population of vocational agriculture teachers in Louisiana who did not have students to apply.

ANALYSIS OF DATA

Descriptive statistics were used to analyze the data for objective 1, stepwise multiple regression was used to analyze the data relative to objective 2 and inferential t-tests were used to analyze the data for objective 3. The Alpha level was set at .01.

RESULTS

Attitudes Towards the Proficiency Award Program

The teachers' responses to statements about the proficiency award program are displayed in Table 1. The data show that both groups of teachers were in greatest agreement with the statement that "FFA awards motivate students." This statement received mean ratings from teachers who had students apply and those who did not of 5.70 (strongly agree) and 5.24 (agree), respectively.

Teachers who had students apply for awards gave their lowest rating (1.62, disagree) to the statement that "awards applications are a waste of my time." Teachers who did not have students to apply gave their lowest rating (1.97, disagree) to the statement that "having students apply for awards is not a part of my job."

Significant differences existed between the responses of the two groups for seven of the 16 statements. Those teachers who had students apply for awards were in stronger agreement with the statements that awards help students to learn skills, FFA awards motivate students, winning awards results in favorable local publicity, awards provide opportunity for recognition of student achievement, and winning an award results in improved self concept for the student. Those teachers who had students apply for awards were in stronger disagreement with the statements that their students' SOE projects weren't good enough to compete against other students and they didn't know how to fill out proficiency applications. These data are presented in Table 1.

Stepwise Regression Analysis

Stepwise regression analysis was used to determine if selected factors were predictors of whether a teacher had students to apply. The variables used in this analysis were years of teaching experience, years of vocational agriculture in high school, number of vocational agriculture teachers in the school, and percent rural students in the program.

Two variables, number of teachers and years teaching experience, were found to be predictors of whether the teachers had students to apply. The likelihood of a teacher having students apply increased as the number of teachers in a department increased and as the number of years teaching experience decreased. Even though these variables were found to be significant predictors, the two variables only accounted for an R^2 of .08. The results of this analysis are presented in Table 2.

Connotative Evaluation of Proficiency Awards Program

The teachers were also asked to evaluate the proficiency award program using a modified semantic differential scale. This evaluation was designed to further evaluate their attitudes towards proficiency awards. The scale was modified so that pairs of terms relative to proficiency awards were used in the scale rather than the 28 pairs of terms developed by Osgood, Suci and Tannenbaum (1957). It should be noted that semantic differential scales "attempt to get at connotative, rather than descriptive, meanings" (Popham, 1981). Popham also noted that since the evaluative dimension is the strongest of the three dimensions of meaning (semantic space, evaluation and potency),

Table 1

Attitudes Held Towards Proficiency Awards by Respondents Who Did and Did Not Have Students to Apply

Statements about proficiency awards[a]		No students applied	1 or more students applied	t
I have time to help students fill out applications	m	4.22	4.24	- .09
	sd	1.26	1.36	
	n	104	37	
Winning awards is an indicator of student achievement	m	4.29	4.86	-2.21
	sd	1.40	1.25	
	n	104	37	
Class time should be used to fill out applications	m	3.90	3.89	- .04
	sd	1.57	1.68	
	n	104	37	
FFA awards motivate students	m	5.24	5.70	-2.64^{**}
	sd	1.03	.46	
	n	104	37	
Winning awards results in favorable local publicity	m	5.06	5.51	-2.63^{*}
	sd	.98	.65	
	n	103	37	
Awards provide opportunity for recognition of student achievement	m	5.07	5.57	3.26^{***}
	sd	.87	.56	
	n	104	37	
I don't know how to fill out proficiency applications	m	3.15	2.30	-3.26^{***}
	sd	1.43	1.13	
	n	103	37	
Awards applications are a waste of my time	m	2.07	1.62	2.48
	sd	.96	.86	
	n	103	37	
Winning of an award by a student results in an improved self concept	m	4.95	5.54	-3.56^{***}
	sd	.95	.56	
	n	102	37	
Awards help students learn skills	m	4.59	5.14	-2.66^{*}
	sd	1.09	1.03	
	n	104	37	

(*table continues*)

Table 1 (continued)

Attitudes Held Towards Proficiency Awards by Teachers Who Did and Did Not Have Students to Apply

Statements about proficiency awards		No students applied	1 or more students applied	t
My students' SOE projects aren't good enough to compete against other students in the state	m	3.23	2.16	3.94***
	sd	1.46	1.28	
	n	104	37	
Awards applications aren't judged fairly	m	2.57	2.06	2.24
	sd	1.24	.94	
	n	98	35	
Awards aren't available for agric./agribusiness skills my students have	m	2.44	1.92	2.52
	sd	1.10	1.01	
	n	102	37	
Winning awards is not important to me	m	2.64	2.14	2.18
	sd	1.19	1.29	
	n	104	37	
Having students apply for awards is not a part of my job	m	1.97	1.89	.44
	sd	.81	1.24	
	n	103	37	
Schools that apply for FFA Best Chapter Award should be required to have proficiency awards applications at the state level during the same year	m	3.53	3.95	-1.23
	sd	1.67	1.93	
	n	103	37	

*p<.01, **p<.005, ***p<.001

[a] 1=Strongly Disagree, 2=Disagree, 3=Slightly Disagree, 4=Slightly Agree, 5=Agree, 6=Strongly Agree

Table 2

Multiple Regression Analysis of Whether Teachers Did or Did Not Have Students Apply for Proficiency Awards (All Variables Entered)

Source	df	SS	MS	F
Regression	2	.22	1.11	6.21*
Residual	137	24.52	.18	
Total	139	24.74	1.29	

------------------------- VARIABLES IN THE EQUATION -------------------------

Variable	B	SE B	BETA	T
Number of teachers	.19	.061	.26	3.10**
Years teaching experience	-.01	.004	.17	-2.61**
(Constant)	.127	.100		1.27

R^2 = .08

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*p<.01

"it is generally recommended for use in semantic differential scales dealing with affect."

The data are presented in Figure 1. As the graph shows, those teachers who had students apply responded in a more positive manner towards the concept of proficiency awards than did those who did not have students to apply.

CONCLUSIONS AND/OR RECOMMENDATIONS

The following conclusions and recommendations are based on the findings of this study:

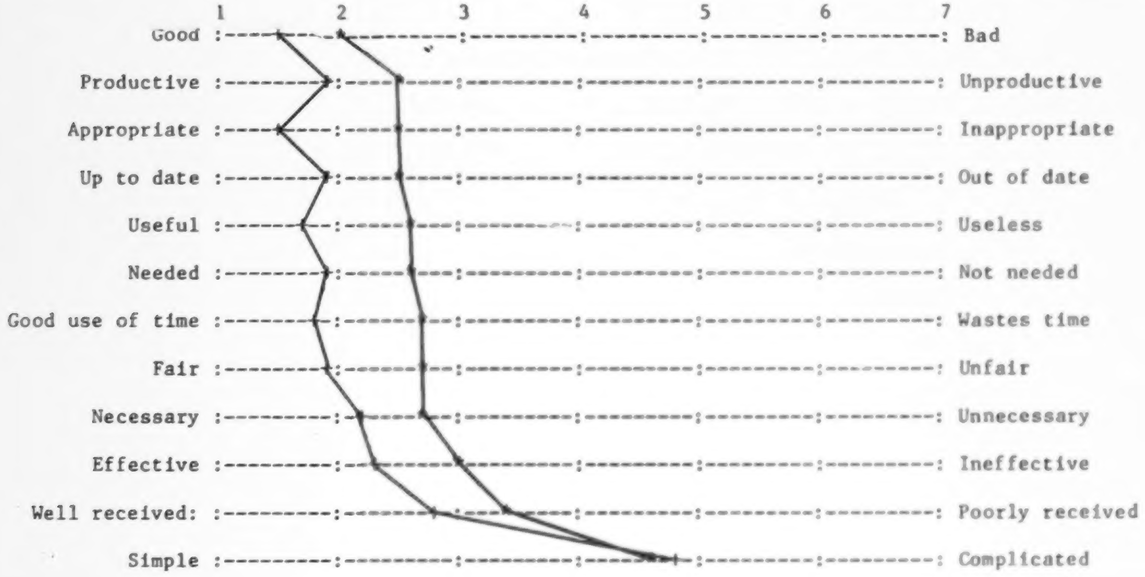
1. Teachers who had students apply were more likely to perceive that proficiency awards (a) help students to learn skills, (b) motivate students, (c) result in favorable local publicity, (d) provide opportunity for recognition of student achievement, and (e) result in improved self concept for the student. These factors relate to the qualitative aspects of the program. It was concluded that teachers who had students to apply have more positive attitudes toward the proficiency award program than those who did not.

2. Those teachers who did not have students apply for awards did not disagree as strongly with the statements that their students' SOE projects weren't good enough to compete against other students and that they didn't know how to fill out proficiency applications. Therefore, it was concluded that the quality of student SOE projects and knowledge of how to fill out the award applications may be factors that resulted in teachers failing to have students to apply for the awards. It is recommended that the state staff conduct workshops or other sessions for teachers on how to fill out the proficiency award applications and to acquaint them with the types and quality of SOE projects that are appropriate for the state proficiency awards program.

Figure 1

Teachers' Connotative Evaluation of the Proficiency Award Program

The FFA proficiency awards program is:



+ Teachers with 1 or more applications   * Teachers with 0 applications

It is also recommended that teacher educators place more emphasis on these factors in the pre-service teacher education program.

3. The likelihood of a teacher having students to apply increased as the number of teachers in a department increased and as the number of years teaching experience decreased. Even though these were significant predictors, they did not account for a practically significant portion of the variance. It is recommended that further research be conducted to determine the teacher related factors that contribute to a teacher either having students to apply or failing to have students to apply.

4. In the connotative evaluation of the program, teachers who had students to apply for awards gave a "better" rating to the proficiency award program than did those teachers who did not have students to apply. It was concluded that teachers who had students to apply had a higher "opinion" of the program than the other group. It is recommended that the state staff should work with teachers who did not have students to apply for awards to improve their opinion of the program.

Recommendations for Further Research

1. This study should be replicated in five years to determine whether changes have been made as a result of this study.

2. Additional research should be conducted to determine the variables that are significant predictors of whether teachers have students apply for FFA proficiency awards. Knowledge of these variables could be used in designing and conducting pre-service and in-service training on proficiency awards applications.

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Attitudes Held by Vocational Agriculture Teachers Toward FFA Proficiency Awards
A Critique

Robert J. Birkenholz, University of Missouri--Discussant

The research conducted by Kotrlik addressed a problem which has affected state FFA associations in many states. Namely, why do so few vocational agriculture teachers encourage their students to participate in the FFA proficiency awards program. Recently, changes have been implemented in the program to encourage a greater level of participation. This research effort was designed to ascertain if selected teacher perceptions towards the proficiency awards program may be related to teacher and, ultimately, student participation.

The Kotrlik study has many strengths which should be noted. Some of the major strengths were:

1. The review of literature, although brief, did identify previous studies which were related to the problem of concern in this study.
2. The introduction of the paper clearly described the problem which was addressed in the study.
3. Objectives developed to guide this research effort were logically stated and appropriate for the study.
4. Procedures used in developing the data collection instrument, selecting the sample, and conducting a nonrespondent follow-up contributed to the quality of the study.
5. Statistical procedures employed to analyze the data collected were appropriate to accomplish the objectives of the study.
6. The inclusion of tabular data and figures enhanced the reader's understanding of the results of the study.
7. Conclusions and recommendations were well-written and supported by the results of the study. It was especially noteworthy that the author appropriately differentiated between statistical significance and practical significance in disucssing the results of the regression analysis.

Although this research effort was generally of high quality, certain questions emerged during a review of the paper. Some of the major concerns were:

1. Were the differences identified in Figure 1 significant?
2. Conclusion/recommendation number two would have been more clear if the double negative would have been eliminated.
3. More emphasis should be placed on the difficulty teachers have in completing proficiency awards applications as evidenced by data in Table 1 and Figure 1.
4. Factors which did not differentiate between teacher groups should also be discussed. (Most notably the finding that both groups tended to agree that they had time to help students fill out applications.)
5. Are there other factors which should be examined which may influence the level of participation in the proficiency awards program?

ATTITUDES OF A SELECTED GROUP OF NEW ENGLAND VOCATIONAL AGRICULTURE TEACHERS TOWARDS SUPERVISED OCCUPATIONAL EXPERIENCE PROGRAMS

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INTRODUCTION

"An important part of all courses in agriculture is the supervised occupational experience programs of the students" (Phipps, 1980, p. 199). Teachers of agriculture are taught this in their teacher preparation program but do they believe it? Harris & Newcomb (1985) studied teacher attitudes toward SOEP in Areas I and II of Texas and found the teachers to believe that SOEP is an integral part of vocational agriculture and production agriculture students should therefore have projects. The findings of this study are limited to production agriculture students and do not support the broader concept by Phipps however that SOEP is important in all areas of agriculture.

What factors are the cause of some teachers of vocational agriculture to do more than others with their supervised occupational experience programs? Arrington (1983) found that the length of a vocational agriculture teachers' contract was significantly related to the project scope of student SOEP and the number of supervisory visits made by the instructor in Florida. Dunham & Long (1984) to the contrary found that an extended teaching contract did not affect the level of student participation in SOEP. Similar findings were reported by Harris and Newcomb (1985) but it should be noted that they only consider 11 and 12 month contracts. Many teachers use a portion of that extra month as vacation time.

Other factors which may have a positive effect on SOEP include teacher experience and teacher dedication. Dunham & Long (1984) found that teacher experience made them more effective in motivating students to participate in a SOEP. McChain (1983) emphasizes the importance of the teacher's belief in the value of the SOEP. The teacher must have a positive attitude or mind set towards visitations.

If we are to provide our vocational agriculture students with this important learning experience we must have teachers who recognize the value of putting in the extra effort to work with their students in placement and supervision of occupational experience programs. It is important, therefore, to identify what teacher attitudes are towards supervised occupational experience programs. If they aren't strongly positive we must identify ways to modify them.

PURPOSE AND OBJECTIVES

The purpose of this study was to identify the attitudes of New England vocational agriculture teachers towards supervised occupational experience programs (SOEP) and determine the relationship to specific variables.

The specific objectives of the study were:

1. To determine the attitudes of New England vocational agriculture teachers toward supervised occupational experience programs using a five-point attitude scale.

2. To determine the relationship of length of contract, size of enrollment, kind of supervision, and number of SOEP visits/student/year to attitudes of New England vocational agriculture teachers towards SOEP.

3. To determine the effect of the type of VoAg program, availability of release time, and contract restrictions on attitudes of New England vocational agriculture teachers towards SOEP.

4. To determine the relationship between SOEP or school laboratory experience and the number of state farmer degrees and proficiency awards earned.

5. To determine the relationship of supervised occupational experience workshops attended, years of teaching, and per cent of graduates becoming entrepreneurs in Ag related areas with teacher attitude toward SOEP.

PROCEDURES

A five-point attitude survey was developed to measure teacher attitudes toward supervised occupational experience programs. Teacher educators in the North East were used to determine the validity of the 48 attitude statements. They were asked to identify each statement as being positive or negative with ninety per cent agreement required for the statement to remain. The questionnaire was then corrected and sent to graduate students at The Pennsylvania State University for field testing. As a result, eleven of the 48 statements were deleted. It was then sent to 30 randomly selected vocational agriculture teachers in Pennsylvania to determine the instrument reliability. Crombach's alpha showed a reliability of 0.84.

ANALYSIS OF DATA

The population frame of this study included eight of the New England states: Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New Jersey, Rhode Island and Vermont. A population of 477 vocational agriculture teachers were identified from those states in the 1984 Agriculture Teachers Directory. A random sample of 97 names was drawn from the frame.

Each vocational agriculture teacher in the sample received a cover letter explaining the project and asking for their assistance, a copy of the questionnaire, a return stamped envelope plus a stick of chewing gum. Three mailings resulted in 71 responses for a 73% return. A telephone survey of 40 per cent (10 selected at random) of the non-respondents was used to determine if they differed from those who responded by mail.

Methods of analysis included mean, Pearson Product-Moment, and t-test.

RESULTS

1. The attitudes of New England vocational agriculture teachers toward supervised occupational experience programs were positive. On a five point attitude scale teachers of production agriculture, agr. mechanics, horticulture, forestry, natural resources and others had a range of 3.8 to 4.0 with horticulture being low and natural resources being high.

2. There was not a relationship between the vocational agriculture teachers attitude score toward supervised occupational experience programs and length of contract, size of enrollment, kind of supervision, or number of SOEP visits/student/year.

3. No significant differences were found in vocational agriculture teachers attitudes among the six programs in vocational agriculture, or with the availability of release time or contract restrictions when comparing teacher attitudes.

4. There was not a significant relationship found between percent of participation of students in supervised occupational experience programs on farms, agribusinesses or in school laboratories and the number of student receiving State Farmers degrees and proficiency awards.

5. There was not a significant relationship found between the number of supervised occupational experience workshops attended, years of teaching experience or per cent of graduates becoming entrepreneurs in agricultural related areas and teacher attitudes toward supervised occupational experience programs.

TABLE I

MEANS and Standard Deviations of Attitude Scores

	Type of Program					
	Prod. Agr.	Agr. Mech.	Hort.	For.	Nat. Res.	Other
No. of Classes	24	23	33	18	12	17
Means	3.83	3.80	3.77	3.89	4.00	3.90
SD's	0.461	0.415	0.461	0.382	0.404	0.490

CONCLUSIONS

The results of this study show that teachers of vocational agriculture have positive attitudes toward supervised occupational experience programs. They understand that it is an integral part of any vocational agriculture program regardless of their length of contract, size of enrollment, availability of release time, or contract restrictions. We therefore have a very positive point to establish a baseline for a longitudinal study of vocational agriculture teachers attitudes towards SOEP. As fewer of our teachers have strong agricultural backgrounds it is important that we provide educational experiences to maintain this positive attitude if supervised occupational experience programs are to remain a part of the vocational agriculture students education.

TABLE II

The following demographic data were identified:

Average teaching experience	Range 0 - 32	14 years
Length of summer contract	Range 0 - 16	5.28 weeks
Ave. enrollment in VoAg prog.	Range 9 - 375	108 students
Percent of students with SOE programs		
On school laboratory		28%
Production ag projects		24%
Farm placement		24%
Agribusiness		28%
No. of SOEP visits/student/yr	Range 0 - 12	2.28 visits
Percent of graduates that become entrepreneurs within five years following graduation		14%
Percent of supervision by		
VoAg teachers		45%
Coop teacher		15%
Related subject teacher		9%
Percent of teachers with release time for SOEP		22%
Percent of teachers with contract restrictions on time available during and after school for visits		24%
Percent of teachers who attended SOEP workshops in last three years		39%

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Attitudes of a Selected Group of
New England Vocational Agriculture
Teachers Toward Supervised Occupational
Experience Programs
A Critique

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The profession has invested a great deal of energy into the development of Supervised Occupational Experience (SOE) and advocates it as a necessary component of the total vocational agriculture program. The researcher accepted the assumption that SOE is important to the total program and teacher attitude is a primary variable which determines the role and scope of SOE in the program.

The introduction did not build a sound theoretical framework which connected the literature with the research objectives and methodology. Consequently, the objectives were broad and sometimes confounded. This can lead to ambiguity or misunderstanding by the reader.

The procedures section was vague and did not provide sufficient details necessary to mentally replicate the study. The sequence involving content validation raised questions regarding the procedure. Although the sampling rationale was not included, a sample of 81 would require a .05 Chi-square probability, a .25 population proportion, and a .05 alpha level to adequately represent 477 vocational agriculture teachers in New England (Hauskins, 1963).

The actual analysis of data was not included in the paper. Table I presented means and standard deviations of attitude scores but confounded interpretation by introducing "number of classes" as a part of the database. Were the attitude scores of teachers derived by pooling 71 responses across 127 classes?

The results section reported "...the attitudes of New England vocational agriculture teachers toward supervised occupational experience programs were positive." However, no relationships were identified between the attitude score and any other variable included in the research. If there is not relationship, the conclusion regarding teacher attitude as an important variable is not valid! I found the study raised more questions than answers.

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DINOSAURS AND VOCATIONAL AGRICULTURE: A HISTORICAL ANALYSIS OF THE CURRICULUM IN VOCATIONAL AGRICULTURE

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INTRODUCTION

In the film Endangered Animals: Will They Survive?, one message is clear - the animals that can adapt to a changing environment are the ones who survive. Even though there is not a film titled Vocational Agriculture: Will it Survive?, that question is being asked by a number of people.

As a result of the numerous educational reform reports during the past few years (Passow, 1984), many states and universities have implemented new graduation requirements and standards. The impact of these actions appear to be detrimental to vocational education and vocational agriculture (Price, 1985). Enrollments are declining, vocational agriculture teachers are being laid off, and contract lengths for vocational agriculture teachers are being reduced.

If vocational agriculture is to survive, it will have to adapt to the changing educational environment. One aspect of vocational agriculture which will be central to its survival is the curriculum. The National Commission on Secondary Vocational Education (1984) recommended that the curriculum in vocational education be overhauled and strengthened. The content and structure of the curriculum in vocational agriculture may hold the key to survival.

An in depth analysis of the curriculum in agricultural education, both past and present, is needed. Such an analysis will be beneficial to the profession in charting the future. Adlai Stevenson stated "We chart our future clearly and wisely only when we know the past which has led to the present."

PURPOSES AND OBJECTIVES

The purpose of this research was to identify the structure and content of the curriculum in vocational agriculture since its inception. By examining the evolution of the curriculum and the forces which have influenced that evolution it will be possible to more accurately make recommendations for future growth (or survival). Specific objectives were:

1. To identify the different ways in which the curriculum has been organized in vocational agriculture.

2. To identify the most successful developments in the vocational agriculture curriculum which hold promise for the future.

PROCEDURES

The research procedure used was historical research. According to Gay (1981, p. 145), "Historical research is the systematic collection and objective evaluation of data related to past occurrences in order to test hypotheses concerning causes, effects, or trends of those events that may help to explain present events and anticipate future events."

Data Collection

After the research problem is identified, the second step in historical research is to collect historical data. In this study the researchers collected historical materials dating to the 1890s. Computerized literature searches of government documents and educational databases were conducted along with a hand search of older publications which were not included in the databases. Specific publications examined were:

U.S.D.A. Bulletins - Office of Experiment Stations
U. S. Department of Education Bulletins
Vocational Education Journal (It has had several names)
The Agricultural Education Magazine
Textbooks in Agricultural and Vocational Education
The Journal of the AATEA
Early Textbooks in Education
Bulletins of the Federal Board for Vocational Education
Dissertation Abstracts International
Phi Delta Kappan
Current Educational Reform Reports
Summaries of Studies in Agricultural Education

Forty-four different source materials were identified which were deemed important in light of the objectives and were used in this study. Due to space limitations all of the sources are not cited in this paper.

Evaluation and Synthesis

In the third stage of historical research careful attention is given to both external and internal criticism. Establishing authenticity of the material is termed external criticism. Internal criticism has to do with establishing the accuracy of the information in the documents.

In the fourth stage of historical research the information that has been collected is organized and synthesized, and conclusions and generalizations are formulated. This constitutes the body of the research presentation and is summarized in the results and recommendations section of this paper.

ANALYSIS OF DATA

Data analysis in historical research is just as exacting, if not more so, than data analysis in quantitative research. "All sources of historical data must be subjected to rigorous scientific analysis to determine both their authenticity (external criticism) and their accuracy (internal criticism)"

(Gay, 1981, p. 149). In most educational research, external criticism is not a major problem since there is not a huge market for forged school board minutes, fabricated government bulletins or altered agriculture texts.

Four factors must be considered in analyzing historical data in relation to internal criticism. They are (Gay, 1981): 1.) Knowledge and competence of the author, 2.) Time delay, 3.) Bias and motives of the author, and 4.) Consistency of data. In this research study special attention was paid to these data analysis concerns.

Most of the authors cited were or are respected authorities in agricultural education. The primary exceptions are high school vocational agriculture teachers who reported on "their" high school curriculum in The Agricultural Education Magazine. There is no reason to believe they would have fabricated information concerning their curriculum. Knowledge and competence of the authors does not appear to be a problem in this study.

With few exceptions, all the material cited was written at the time the various curriculum decisions and events were being made. The exceptions are historical accounts of agricultural education written by noted authorities in agricultural education such as H. M. Hamlin. There was no evidence to suggest time delay was an internal criticism problem in this research.

The data appeared to be consistent and the researchers could not discern a bias in the reporting of the data. Most authors would tell why they preferred a particular method of curriculum construction but they would describe the other procedures also being used. The discussion of curriculum decisions during each decade by the various authors showed consistency.

RESULTS

Early Curriculum Efforts in High School Agriculture

A basic secondary vocational agriculture curriculum was developed as far back as the 1890s and parts of it are still used today. In the 1890s remedial type agriculture courses were being taught in colleges to prepare students for college level agriculture courses. There was a need to prepare students in high schools for college agriculture courses to relieve the colleges of this task (U.S.D.A., 1902).

The Committee on Methods of Teaching Agriculture of the U.S.D.A. Office of Experiment Stations met and set up a basic curriculum for the high school during the 1890s. The following topics were suggested for study in agriculture (U.S.D.A., 1902, p. 5); Agronomy, Zootechny (Animal Science), Dairying, Rural Engineering, and Rural Economy. This curriculum was to cover a span of four years. During the first three years students were to spend five periods a week in the study of agriculture. In the senior year the time was to be expanded to seven and a half periods per week.

Between 1900 and 1917 many state superintendents of public education prepared agriculture curriculum for the public schools. A typical curriculum in agriculture was two years in length. Crop science was taught the first year and animal science was taught during the second. The term used to describe this approach to the curriculum was "the box system" (Floyd, 1934) or the "traditional" curriculum (Cook, 1947).

The year long approach to organizing the curriculum around one topic was borrowed from the agriculture colleges (Hamlin, 1956). In the early part of the 1900s secondary schools tried to pattern much of their curricula after that of the college. Little attention was paid to the needs of the community or the interests of the students (Berry, 1924).

The 1920s - A Decade of Change

After the passage of the Smith-Hughes Act and the establishment of the Federal Board for Vocational Education the leaders in agricultural education began to take a serious look at the curriculum. During the 1920 decade two major changes occurred with the curriculum.

Occupational analysis received attention during the 1920s as a technique for determining the content of the curriculum. Rufus W. Stimson, state supervisor of vocational agriculture in Massachusetts, advocated using occupational analysis to determine the content of the curriculum (1922). Lathrop (1922, p. 16) after stating "Heretofore, we have not based our courses in agriculture on occupational analysis" provided detailed guidelines on how to conduct an occupational analysis. It appears the advice of Stimson and Lathrop was heeded as evidenced by the fact that the subject matter bulletins in agriculture published by the Federal Board for Vocational Education were based on "enterprise analysis" after 1922 when their earlier ones were based on "units of instruction."

The second curriculum development was the cross section approach to organizing the curriculum. In a presentation to the National Society for Vocational Education in 1923 Eaton said "An ideal, perhaps, for the organization of a four-year course might be to run the enterprise units of study in parallel during the first three years so as to have a cross section (underline ours) of the farm vocation in terms of the major, contributory, and minor enterprises every year. . ." (Federal Board for Vocational Education, 1925, p. 11.)

In the cross section approach a variety of topics such as crops, livestock, farm shop, etc. are covered each year. The information taught in one year serves as the foundation for teaching for the next year. In reviewing the history of agricultural education, Hamlin (1956) recognized Eaton's work as being important in the development of the curriculum.

The 1930s - A Decade of Confusion

During the 1930s the cross section approach to curriculum development and occupational analysis were gaining ground, yet there were many teachers who held to the more traditional approach to the curriculum. It appears the profession wasn't sure which way to go. This is illustrated by Cook in the Handbook on Teaching Vocational Agriculture which was first published in 1933. He described both the box (traditional) and the cross section approach as acceptable formats for organizing the agricultural curriculum.

Another factor which added to the confusion in organizing the curriculum was the attendance pattern of the students. Hamlin (1956, p. 41) wrote, "There was a heavy drop-out the first two years in high schools for the period. It seemed logical to provide courses in vocational agriculture the first two years, so as to reach as many farm boys as possible . . . Not until about 1930 were courses generally offered in the 11th and 12th grades." During the 1930s schools and states were wrestling with the two year versus the four year curriculum problem.

The leaders in the profession were pushing the cross section approach to organizing the curriculum. Lathrop, who was the research specialist in agricultural education for the U. S. Office of Education, advocated the "cross section method" and used the term "dark ages" (1935, p. 86) in referring to the box or traditional curriculum. Deyoe's state of the art article (1939) "The Cross-Sectional Course in Theory and Practice" appears to have been the final AMEN in establishing the cross section method as THE method for curriculum organization in vocational agriculture by the end of the 1930 decade.

The 1940s - A Decade of Compromise

A marriage of the traditional and cross section approach to curriculum organization occurred in the 1940s. This combined approach to curriculum development was labeled the modified cross section. The approach was described by Cook (1947, p. 149), "A modified cross-sectional plan (is an approach) in which a phase of instruction such as livestock or field crops is used as a central emphasis along with selected units or jobs or problems from other phases of instruction needed the current year." Cook identified three approaches to organizing the curriculum; the traditional, the cross-sectional, and the modified cross-sectional. He indicated the cross sectional and modified cross sectional plan were the major plans in use.

The 1950s - A Decade of Calm

The 1950s were relatively uneventful for curriculum development in agriculture. Hamlin (1956) indicated the traditional approach to curriculum development had died out by 1956. Hammonds (1950) reported the cross sectional and modified cross sectional approach to curriculum development were common. The major problem identified by Hammonds (p. 88) was to find time to teach new content such as fire protection, farm safety and farm guidance.

The 1960s and 1970s - Decades of Choice and Concentration

The passage of the Vocational Education Act in 1963 caused major changes in the organization of the curriculum. The curriculum was diversified. Before 1963 the objective of vocational agriculture was to prepare students for careers in farming. After 1963 the objective of vocational agriculture was to prepare students for a wide variety of careers in agriculture including farming careers and off-farm agricultural occupations.

Employment surveys were conducted to determine where employees were needed. The task analysis approach to curriculum development, which had been relatively dormant for several decades, was revived to determine what tasks were involved in these new occupational areas. Between 1964 and 1966 a number of issues of The Agricultural Education Magazine contained at least one article on the results of an occupational analysis on some agricultural occupation. National studies on needed competencies in various agricultural occupations were conducted to serve as the foundation for the curriculum in the new areas of agriculture.

The structure of the secondary curriculum was altered to accommodate the new areas of agriculture. In many states the curriculum emphasis in the first two years of vocational agriculture was still a cross section approach. Roberts (1971, p. 164) called this approach to the curriculum the "core" approach. In the junior and senior year students were allowed to choose an area of concentration or specialization. Junior and senior students who desired to be farmers continued their studies using the cross sectional or modified cross sectional approach. Students who desired to specialize in off-farm agricultural occupations such as horticulture or agricultural mechanics could follow several routes.

In some states, such as Alabama, the agriculture teachers in regular high schools were expected to provide individualized instruction to the juniors and seniors in each students' area of concentration (Baker, 1966). In other states, such as Ohio, specialized courses were moved to a centrally located vocational school which served several high schools (Russo, 1965). Students spent the entire day at the school with most of the time (approximately 4 1/2 hours) devoted to the specialized study of horticulture, agricultural mechanics, or some other agricultural occupation. In other states, such as Indiana, junior and senior students would spend half a day at a centrally located vocational school learning the agricultural specialty and then spend the remainder of the day back at their local high school in the traditional academic classes.

One trend which emerged in a few localities during the 1960 and 1970 era was the modular approach to curriculum development. The curriculum was organized into semester long or grading period long courses. Students could pick and choose which courses they wanted to study. In Janesville, Wisconsin one teacher taught 16 different semester courses (Hensel, 1965). In some multiple teacher departments students could choose from over 30 different modules in agriculture such as farm electrification, leadership development and livestock evaluation.

The 1980s - A Decade of Concern

A number of educational reform reports were published in the 1980s. These reports led to intensive examinations of the high school curriculum and resulted in the more emphasis on strictly academic subjects such as mathematics, English, and foreign languages. The number of hours of electives were reduced. These actions tended to reduce enrollments in agriculture.

The full impact of the Carl Perkins Act on the curriculum is currently an unanswered question. High technology, under-served populations, linking vocational education with mathematics and sciences, and program improvement instead of program maintenance were major provisions of the act.

The 1980s can be characterized as a decade of concern. The final verses have yet to be written.

CONCLUSIONS AND/OR RECOMMENDATIONS

In the early 1960s, several members of the profession indicated that agricultural education was at the crossroads (Krebs, 1961). Some teacher educators believe that the profession is again at a crossroads. If vocational agriculture does not adopt to the changing environment we may become like the dinosaur - extinct. Based upon our analysis of the past, and the events of the present we would offer the following recommendations concerning the future for curriculum development in vocational agriculture:

1. The content needs to be packaged in a modular fashion. Because of the emphasis on increased standards many students will not be able to spend several hours each day in the junior and senior year in vocational agriculture. One period per day semesterized courses should be considered.

2. There should be an introductory course in agriculture that serves as the "gateway" for the remainder of the courses. This introductory course should be based upon the cross section approach to curriculum development.

3. The curriculum in the upper grades should be based on occupational analysis but the profession should carefully heed the warning of Lathrop (1922) that conditions change and new competencies emerge in the various agricultural occupations. Many of the competency studies conducted ten to fifteen years ago are now out of date. The profession needs to constantly update the competency studies on which the curriculum is based.

4. Since the Carl Perkins Act placed an emphasis on the mathematical and scientific aspects of vocational education attention should be given to identifying the science and math concepts that are taught in agriculture. State departments of education then should be encouraged to give science credit for these courses. Bricker (1911) reminds us the first courses in agriculture were taught by science teachers and emphasized the scientific aspects of agriculture. This approach to the curriculum would help bridge the gap identified by the National Commission on Secondary Vocational Education.

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Dinosaurs and Vocational Agriculture: A. Historical Analysis of the Curriculum in Vocational Agriculture
A Critique

Alfred J. Mannebach, University of Connecticut--Discussant

The authors have addressed an important topic and have written an excellent overview of how the vocational agriculture curriculum has been planned, organized and delivered since the 1890's. The authors presented the major organizational patterns of the vocational agriculture curriculum over the last one-hundred years. This historical persepctive is valuable to agricultural educators as they cope with current issues and conçerns and chart the course of the vocational agriculture program for the future.

The specific strengths of the paper were: (1) The authors dared to conduct and present historical research. Historical research may be one of the most fertile fields in which to conduct agricultural education research at the current time. In this period of reform and fast-paced changes in education, along with limited state and federal funds for educators to become involved in other research and development activities, historical research may provide data which will allow us to reflect on past decisions and accomplishments and to chart our future more wisely. (2) A good rationale for writing the paper was presented. (3) An excellent overview of the definition and essential components of historical research were integrated into the paper. (4) Relevant documents were identified and analysed. (5) A relevant overview of past curriculum patterns was presented and (6) conclusions were drawn and recommendations were presented clearly.

Following are the perceived weaknesses of the paper: (1) No definition of "curriculum" was presented. (2) Curriculum variations exist between states and, indeed, within states. We must trust the authors judgment that predominant Organizational patterns for the vocational agriculture curriculum were identified. (3) The authors first recommendation that "the content needs to be packaged in a modular fashion" is suspect. It seems to be a simple answer to a complex question. Is the proprosed solution an add-on, a compromise, or a substitute to the present curriculum? With modular, semesterized courses, what happens to the "individualized student development program over time" which has characterized the success of vocational agriculture educators over the years. Modules may be the answer to keeping agriculture teachers employed, but the teaching of modules only raises serious questions about the continuation of the components which have made our programs vocational, namely, supervised occupational experience programs, the FFA, record books, laboratory instruction and instruction based on student objectives and occupational opportunities. (4) The second recommendation that "there should be an introductory course in agriculture that serves as the 'gateway' for the remainder of the courses" is also questionable. Why the introductory course? At best an introductory course would be "general" agriculture, not vocational agriculture. What would be the content of the introductory course and why is it needed prior to taking the semester modules? (5) The authors' third recommendation suggests that the curriculum be based on occupational analysis and competencies needed in the industry of agriculture. While most would agree that the curriculum should be based on occupational analysis, few would agree that it should be based only on occupational analysis. The question of "breadth" of instruction verses "depth" of instruction is raised as well as a curriculum based on individual interests and community needs.

In summary, the authors did a msterful job of attaining their first objective, namely, to identify the different ways in which the curriculum has been organized in vocational agriculture. They were less successful in attaining the second objective of identifying the most successful developments in the vocational agriculture curriculum which hold promise for the future. However, they did provide the bacground needed for the debate to ensue, and herein lies a major value of the paper.

EDUCATIONAL REFORM: THE INFLUENCE OF ENROLLMENT IN VOCATIONAL AGRICULTURE ON ADMISSION TO A COLLEGE OF AGRICULTURE

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INTRODUCTION

One recommendation of the recent reports advocating educational reform is a core curriculum for all high school students (Adler, 1982; Boyer, 1983; Goodlad, 1984; National Commission on Excellence in Education, 1983). Usually the proposed core curriculum does not include courses in vocational education, including vocational agriculture. Accompanying this high school educational reform-excellence movement are changes by higher education governing boards and colleges and universities in a number of states to establish a prescribed pattern of high school course work for admission to higher education (Goertz & Johnson, 1985). These admission requirements stress college preparatory courses and usually exclude vocational courses.

There is agreement that certain academic competencies--reading, writing, speaking and listening, using mathematics, reasoning, and studying--are essential for success in college. The argument follows, then, that these academic competencies are best acquired through completion of the following basic academic subjects: English, the arts (visual, theater, music, and dance), mathematics, science, social studies, and foreign language (The College Board, 1983).

Some groups and individuals contend that the changing admission requirements for higher education may impact negatively on enrollment in colleges of agriculture and particularly on enrollment in high school vocational agriculture courses since students completing these courses may be less likely to complete a college preparatory curriculum. Peterson (1986) has described well the challenges for vocational agriculture posed by the excellence in education movement. Wolf (1976) reported a negative relationship between the number of units of vocational agriculture completed in high school and the number of units of college preparatory courses completed. However, research conducted over a number of years indicates that students who study vocational agriculture in high school perform academically just as well in college as students who do not study agriculture in high school. The research also indicates that higher proportions of students who study vocational agriculture in high school graduate from colleges of agriculture than do students entering colleges of agriculture who do not study vocational agriculture in high school (Carpenter & Rogers, 1970; Newcomb, 1978; Warmbrod & Phipps, 1966; Wolf, 1976).

This paper reports research pertaining to recently instituted admission requirements at one land grant university, The Ohio State University, and its influence on the academic preparation of students entering the College of Agriculture, including the extent to which entering students have studied vocational agriculture in high school. The Board of Trustees of The Ohio State University announced in April 1982 a policy requiring entering freshmen, beginning autumn quarter 1984, to complete a college preparatory curriculum in high school to be admitted unconditionally. The prescribed college preparatory courses are four units of English, three units of mathematics, two units of social science, two units of science, two units of one foreign language, one unit of visual or performing arts, and one additional unit from any of the required subjects. A total of 15 college preparatory units is required for "unconditional" admission. Students who do not meet this requirement are admitted as "conditional" and are required to remove the deficiencies by completing courses in the areas of deficiency that do not count toward graduation or to demonstrate competence in the areas of deficiency by placement tests.

PURPOSE AND OBJECTIVES

The purpose of the research was to describe how the conditional/unconditional admissions policy influences the academic qualifications and credentials of students entering the College of Agriculture and to explore the extent to which enrollment in vocational agriculture in high school impedes or enhances high school students in completing the required college preparatory curriculum. Using data for entering freshmen for four years (1982-83 to 1985-86), the following research questions were investigated:

1. What percentage of the freshmen entering the College of Agriculture complete the college preparatory curriculum required for unconditional admission?
2. To what extent does enrollment in vocational agriculture in high school influence the percentage of entering freshmen who complete the college preparatory curriculum required for unconditional admission?
3. What are the academic qualifications of students entering the College of Agriculture, and are there differences in the academic qualifications of entering students who have studied vocational agriculture in high school and those who have not?

PROCEDURE AND ANALYSIS OF DATA

The design of the study was a time series analysis. The academic characteristics and high school course patterns of freshmen entering the College of Agriculture at The Ohio State University were studied for a four-year period including two years prior to and two years after the implementation of the conditional/unconditional admissions policy. Data were collected from the entire populations of students entering autumn quarters 1982 (n=180), 1983 (n=141), 1984 (n=186), and 1985 (n=166). The data were obtained from official university records in the administrative office of the College of Agriculture. Data collected from transcripts and other official documents were number and type of courses completed in high school, high school grade point average, rank in high school graduating class, and ACT scores. Descriptive statistics were used to analyze data.

RESULTS

Unconditional Admission

Since 1982 the percentage of entering freshmen who completed the college preparatory curriculum required for unconditional admission has increased consistently (Table 1). In 1982, 12% of all entering freshmen were admitted unconditionally; in 1985, 56% were admitted unconditionally. As reported in Table 1, the trend described for the percentage of students admitted unconditionally holds for the percentage of students completing the required number of units in English, mathematics, science, foreign language and visual or performing arts. The percentage of students completing at least two units of social science has not changed noticeably since 1982, varying from 97% to 100%. Enrollment in vocational agriculture can be used to meet the requirements for visual or performing arts. The data in Table 1 report the percentage of students who meet this requirement exclusive of enrollment in vocational agriculture.

The total number of high school units completed by entering students has increased consistently from a mean of 22.0 in 1982 to a mean of 22.8 in 1985 (Table 2). Also, the number of college preparatory courses students completed in high school has increased during the four years from a mean of 13.4 in 1982 to a mean of 16.1 in 1985.

Entering students' rank in high school graduating class, their high school grade point average, and their ACT scores have steadily improved during the four-year period. Prior to 1984, the percentage of entering students who were in the highest quartile of their high school graduating class was 52%. The data reported in Table 3 indicate that in 1984 and 1985 the percentages of entering students who were in the highest quartile of their high school graduating class was 62%. The ACT composite score for entering students increased from a mean of 20.6 in 1982 to a mean of 21.6 in 1985. Similar trends are also indicated for ACT scores in English, math, natural science, and social science. For ACT composite score, new first quarter freshmen entering the College of Agriculture autumn quarter 1985 (mean=21.6) are similar to all new first quarter freshmen entering The Ohio State University (mean=21.5) autumn quarter 1985.

Influence of Enrollment in High School Vocational Agriculture

Since 1982, the percentage of students entering the College of Agriculture who studied vocational agriculture in high school has increased from 49% in 1982 to 61% in 1985. The vast majority of the entering students who have studied vocational agriculture in high school completed three or four years of high school vocational agriculture (Table 4).

The data previously reported in this paper indicate that the percentage of entering students who are admitted unconditionally as well as the percentages completing the required courses in English, mathematics, science, social science, foreign language, and visual or performing arts have increased steadily since 1982. The data reported in Table 1 show that these trends hold both for entering students who studied vocational agriculture in high school and for students who did not study vocational agriculture in high school. The only differences between these two groups of students (students enrolled in vocational agriculture in high school and students not enrolled in vocational agriculture in high school) is that the percentages for students not enrolled in vocational agriculture in high school are, for most of the requirements, consistently higher than the percentages for students who studied vocational agriculture in high school.

Students who studied vocational agriculture in high school consistently ranked higher in their high school graduating class than students who had not studied vocational agriculture in high school, although there were no appreciable differences in high school grade point averages between the two groups (Table 5). During the four years, the percentage of students who were in the highest quartile in their high school graduating class varied from 45% to 62% for students who had not studied vocational agriculture in high school and from 58% to 64% for students who studied vocational agriculture in high school.

Data indicate that students who had not been enrolled in vocational agriculture in high school had slightly higher ACT composite scores and ACT scores for English, math, social science, and natural science than students who had been enrolled in vocational agriculture in high school.

There was a substantial negative relationship between the number of units of vocational agriculture completed in high school and the number of units of college preparatory courses completed in high school. The correlation coefficients varied from -.48 to -.57 for the four years. However, there were low to negligible relationships between the number of units of vocational agriculture completed in high school and rank in high school graduating class, high school grade point average, ACT composite score, and total number of high school credits.

CONCLUSIONS AND RECOMMENDATIONS

The conditional/unconditional admissions policy announced by The Ohio State University in 1982, to be effective autumn quarter 1984, has been accompanied by changing patterns of high school courses completed by students entering the College of Agriculture. During the four-year period from 1982-83 to 1985-86, a higher percentage of entering students (12% in autumn quarter 1982; 56% in autumn quarter 1985) completed the 15 prescribed units of high school college preparatory courses. This increasing trend for the percentage of students admitted unconditionally also holds for the percentages of entering students who completed the prescribed number of units in English, mathematics, science, social science, foreign language, and visual or performing arts. Also, during the four-year period, new first quarter freshmen in the College of Agriculture ranked higher in their high school graduating class and achieved higher scores on ACT tests in 1985 than had been the case in 1983.

The trends described in the preceding paragraph that accompany the announcement and implementation of the conditional/unconditional admissions policy hold both for students entering the College of Agriculture who studied vocational agriculture in high school as well as for students who did not enroll in vocational agriculture. During the four-year period, the percentage of all new first quarter freshmen in the College of Agriculture who had studied vocational agriculture in high school increased from 49% in 1982 to 61% in 1985. The data clearly indicate that enrollment in vocational agriculture in high school does not prevent students from completing a college preparatory curriculum; however, the data also indicate that students who enroll in vocational agriculture in high school are somewhat less likely to complete a college preparatory curriculum in high school. A warranted conclusion is that high school students can complete college preparatory courses required for unconditional admission and enroll in vocational agriculture.

Further research is recommended to investigate (a) the relationship between the patterns of high school courses completed by students and their achievement in the College of Agriculture; and (b) what factors in the high schools impede and encourage students enrolled in vocational agriculture to complete a college preparatory curriculum.

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Table 1

Percentage of Entering Students Completing Requirements for Unconditional Admission: Students Enrolled in and not Enrolled in Vocational Agriculture in High School

Requirement/Year	All Students %	Not Enrolled in Vo-Ag %	Enrolled in Vo-Aq %
All requirements			
1982	12	17	6
1983	21	34	11
1984	30	38	22
1985	56	76	43
4 units English			
1982	52	59	44
1983	68	81	58
1984	76	81	69
1985	95	100	92
3 units mathematics			
1982	72	80	63
1983	82	92	77
1984	91	97	86
1985	90	90	89
2 units social science			
1982	97	96	97
1983	100	100	100
1984	98	99	96
1985	100	100	100
2 units natural science			
1982	82	87	76
1983	85	90	82
1984	89	97	82
1985	95	100	91
2 units foreign language			
1982	41	62	19
1983	41	68	18
1984	58	76	39
1985	66	89	50
1 unit visual or performing arts[a]			
1982	52	56	47
1983	46	53	39
1984	49	55	42
1985	41	84	42
15 units required courses			
1982	40	65	14
1983	46	74	23
1984	65	87	43
1985	71	95	56

[a] Does not include credit for enrollment in vocational agriculture.

Table 2

Total Units and College Preparatory Units Completed by Entering Students

Number Units Completed/Year	Mean	SD
Total high school units		
1982	22.0	1.89
1983	22.1	1.81
1984	22.4	1.89
1985	22.8	1.80
College preparatory units		
1982	13.4	2.79
1983	14.2	2.70
1984	15.3	2.43
1985	16.1	2.50

Table 3

High School Characteristics of Entering Students

Characteristic/Year	Mean or %	SD
Grade point average		
1982	3.12	.56
1983	3.13	.69
1984	3.21	.49
1985	3.23	.54
Percentile in graduating class		
1982	71.5	23.3
1983	74.0	19.8
1984	76.5	19.9
1985	76.8	20.9
Percentile in highest quartile		
1982	52%	----
1983	53%	----
1984	63%	----
1985	62%	----

Table 4

Years of Vocational Agriculture Completed in High School by Entering Students

No. of Years of Vo-Ag	1982		1983		1984		1985	
	No.	%	No.	%	No.	%	No.	%
0	86	51	62	45	89	50	63	39
1 or 2	9	5	9	6	12	7	12	8
3 or 4[a]	74	44	67	49	76	43	86	53
Total	169	100	138	100	177	100	161	100

[a] Includes the following numbers of high school graduates each year who attended area vocational schools: 1982, 7 students; 1983, 2 students; 1984, 4 students; 1985, 2 students.

Table 5

High School Characteristics of Entering Students: Students Enrolled in and not Enrolled in Vocational Agriculture in High School

Characteristic/Year	All Students	Not Enrolled in Vo-Ag	Enrolled in Vo-Ag
Grade point average (mean)			
1982	3.12	3.07	3.18
1983	3.13	3.14	3.12
1984	3.21	3.18	3.23
1985	3.23	3.24	3.24
Percentile Rank in Graduating Class (mean)			
1982	71.5	67.4	75.9
1983	74.0	73.0	74.8
1984	76.5	75.7	76.6
1985	76.8	74.8	78.1
Percent in Highest Quartile (mean)			
1982	52	45	62
1983	53	48	58
1984	63	62	63
1985	62	61	64

Educational Reform: The Influence of Enrollment In Vocational Agriculture on Admission To A College Of Agriculture
A Critique

R. Lee Cole, Oregon State University -- Discussant

This was a very well done, professional paper. The paper sought to discover important information relative to a very recent develop: the educational reform movement. The paper was consistent throughout with agreement in title, purpose, objectives, results, conclusions, and recommendations. Appropriate methodology was used, and the authors very clearly stayed within the limits of the design and statistical procedures employed. I detected no major problems in the paper but did have a few concerns which if addressed should strengthen the paper.

The introduction was one of the best introductions I have read. It was very well done and I would refer it to others as a model, given the constraints of this type of research paper. I would suggest two refinements which may make it even better.

> First, write using shorter sentences. There were several five line sentences in the introduction and throughout the paper. At times the paper is difficult to follow and somewhat cumbersome because of sentence length.
>
> Second, do something with the Peterson citation. You simply said he described well the challenges for vocational agriculture in a context which begged to have those challenges identified.

The authors state clearly and correctly that the purpose of the study was to describe only. The results were given in descriptive terminology yet two terms were used in the procedure section that would indicate more was to be presented than descriptive statistics.

> 1) It was stated that the design of the study was a time series analysis. According to the book Time Series Analysis Forecasting and Control, the purpose of a time series analysis study is to: a) forecast; b) estimate transfer functions; and/or c) design control systems. Neither a time series statistical treatment nor the fulfillment of any one of the three major functions identified for the time series study were done in this study. Therefore such terminology is unwarranted.
>
> 2) The last line of the procedure paragraph said "Descriptive statistics were used to analyze data." Descriptive statistics were used to present data, not analyze them.

A final remark has to do with the conclusions and recommendations section. It appeared to me that objective number three was not well treated in this section. Given the importance of that objective it would strengthen the paper to address this objective clearly in the conclusions.

Again, let me emphasize that this was a well thought-out, well written paper. I believe it is worthy of publication in order to share what is presented here with the profession.

EFFECTS OF A HEARING PROTECTION DEVICE ON PERFORMANCE OF STUDENTS IN NOISY ENVIRONMENTS

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INTRODUCTION

Students in agricultural mechanics laboratories in the United States are subjected to loud noise. These noise levels often exceed the safety limits for noise set by OSHA, as documented by Bates (1983), Bear (1969), Madou-Bangurah (1978), Shell (1972), Wall and Jessee (1971), and Weston and Stewart (1980). In addition to personal safety concerns, Daniels (1985) and Jewell (1977) documented reduced student performance as a result of noise. Devices are available to protect students from exposure to noise. Weston and Adams (1935) and Hartley (1974) found improved performance when subjects wore hearing protection devices (HPD's). Hearing protection devices range in effectiveness from 25dB(A) to 40dB(A) reduction and vary in cost from more than of $35.00 to less than $0.25 for bulk packaged disposable devices capable of reduction of as much as 31dB(A). Does the use of these devices reduce the negative effects of noise on student performance in agricultural mechanics laboratories?

PURPOSES

This study examined the effects of a hearing protection device on student performance of agricultural mechanics skills. The study addressed the following research questions:

1. Will students who wear HPD's while in a noisy environment score higher on cognitive activities than students who wear a placebo device?
2. Will students who wear HPD's while in a noisy environment score higher on motor skill activities than students who wear a placebo device?

Two null hypotheses were formulated and tested at an alpha level of $\underline{p} < .10$.

HO-1: There is no significant difference between group mean performance scores on cognitive agricultural mechanics activities with exposure to attenuated and non-attenuated noise of 100dB(A) for 30 minutes.

HO-2: There is no significant difference between group mean motor skill performance scores with exposure to attenuated and non-attenuated noise of 100 dB(A) for 3 minutes.

PROCEDURE

The study was conducted as a randomized, posttest only, control group experimental design (Campbell and Stanley, 1963). Pilot tests were conducted on the source of noise to be used, the ability of the recordings and amplifiers to reproduce true frequencies, the format of the cognitive test, and the proper administration of the motor test. A field test was conducted to evaluate the functioning of the equipment and data collection procedures. Ten teachers enrolled in AEE 8533/8543, Workshop in Agricultural and Extension Education: Power Train II were presented the entire testing procedure in August, 1985.

The source of the noise selected was a Poulan Counter-Vibe model 3400 chain saw with the bar and chain removed. The noise was recorded using a Sanyo stereo cassette deck, a Realistic microphone, a Superscope Stereo Cassette Deck, and a Realistic Stereo Frequency Equalizer. Recorded frequencies were adjusted using the equalizer to reproduce the chain saw noise as nearly as possible. Noise frequencies and levels were measured using a IVIE Electronics Audio Spectrum Analyzer and checked against a Radio Shack meter. The Noise was reproduced using a Realistic 64 watt amplifier and the Sanyo tape deck through 4 channels and 4 speakers.

The population frame consisted of 162 advanced agricultural mechanics students (11th and 12th grade) who attended one of 13 public schools in Mississippi within a 46 mile radius of Starkville, Mississippi. Students with observable hearing losses were removed from the population before the random sample was drawn. The random sample consisted of 60 students plus 22 replacements. Students were randomly assigned to treatment and control groups. Data collection began on January 21, 1986 and was completed on February 20, 1986. Equipment arrangement, student seating, and instructions were replicated at each of the 13 schools.

Standardized tests consisting of the General Aptitude Test Battery (GATB) section on finger dexterity and the American Institute of Research (AIR) Test of Farm Equipment Mechanics on diagnosing malfunctions were used throughout the study.

A placebo device was developed for the control group. It consisted of one quarter of a cotton ball placed loosely in the outer portion of each ear. Hearing protection devices were placed in identical containers to eliminate Hawthorne effects (Isaac and Michael, 1981). The experimental group received a disposable foam hearing protection device capable of 31dB(A) attenuation. Sound levels were carefully monitored throughout the testing and 100 dB(A) maintained at the student's ear.

Student semester grade in vocational agriculture and race were collected as variables for post hoc analysis. Both the treatment and control groups, as well as replacements, received all tests concurrently.

ANALYSIS OF DATA

Statistical decisions were based on results of a one-way analysis of variance (Morse, 1985). Appropriate post hoc analyses were conducted to assure the data met the assumptions of ANOVA. Homogeneity of the data was established using the Bartlett-Box test. Post-hoc correlations were conducted using Pearson Product Moment correlations in a matrix format (Norusis, 1984). The decision for each hypothesis was based on an alpha level of $\underline{p} < .10$.

RESULTS

Hypothesis one was rejected. Students exposed to attenuated noise performed significantly better on the cognitive measure than students without attenuation [$F(1,58) = 7.68$, $p < .007$].

Hypothesis two was rejected. Students exposed to attenuated noise performed significantly better on the motor measure than students without attenuation [$F(1,58) = 3.89$, $p < .05$]

Post hoc correctional studies revealed significant moderate correlations for the variables Grade with Race ($r = .38$, $p < .002$), Grade with Cognitive Score ($r = .33$, $p < .009$), Group with Cognitive Score ($r = .34$, $p < .007$), Group with Motor Score ($r = .25$, $p < .053$), and a significant weak correlation for Race with Motor Score ($r = .24$, $p < .062$). No significant correlations were found for Grade with Group, Grade with Motor Score, Race with Group, Race with Cognitive Score, or Cognitive Score with Motor Score.

CONCLUSIONS

There were significant statistical and practical differences between group mean performance scores on cognitive agricultural mechanics activities with exposure to attenuated and non-attenuated noise of 100 dB(A). Students who completed the cognitive measure with a HPD capable of reducing the noise by 31dB(A) scored significantly ($p < .007$) better than students completing the same test in the same environment wearing a placebo device. The improvement was 13% on the mean scores. Therefore, it was concluded that wearing a HPD reduces the loss of student performance associated with noisy laboratory conditions.

There were significant differences between group mean motor skill performance scores with exposure to attenuated and non-attenuated noise of 100dB(A) for 3 minutes. Students who performed a motor skill while wearing a HPD scored significantly ($p < .05$) better than students who completed the same activity in a non-attenuated environment. The improvement was 4% on the mean scores. Therefore, it was concluded that wearing a HPD capable of reducing noise commonly found in agricultural mechanics laboratories by 31dB(A) will reduce performance losses of students.

These results may be viewed as empirical evidence by agricultural mechanics instructors that student performance loss in the cognitive and motor domains may be reduced by providing students with effective hearing protection devices when noisy conditions exist in the laboratory. The findings have practical significance. Effective personal hearing protection devices were available for less than $.25 per student. This cost was minimal when compared with a 4 and 13% student performance improvement. By providing hearing protection whenever noisy equipment is to be operated while students perform cognitive and/or motor skills, teachers will reduce performance losses. These reductions in performance losses occur well below levels that endanger student health. Routine use of HPD's will insure that they are in place when exposures reach health threatening levels.

RECOMMENDATIONS

Because noise typically found in agricultural mechanics laboratories is detrimental to student performance on cognitive and motor skills and because quality HPD's can reduce these losses, the use of HPD's should be recommended for routine use equal to safety glasses. Students in agricultural mechanics laboratories should use efficient hearing protection devices.

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EFFECTS OF HEARING PROTECTION DEVICE ON PERFORMANCE OF STUDENTS IN NOISY ENVIRONMENTS
A Critique

James Knight, The Ohio State University--Discussant

Introduction

This study was conducted as a randomized, posttest only, control group experimental design (Campbell & Stanley, 1963). It is a study of significance because of the obvious health concerns presented to students and instructors who work in laboratories with noise levels that often exceed normal safety limits as set by OSHA.

Significant Findings

This study found that hearing protection devices (HPD's) reduced loss of student performance associated with noisy laboratory conditions. The loss was reduced in both the cognitive and motor domains. When considering both student performance and the long term health concerns in this area, it is clear that the recommendation of the authors that the use of HPD's should be recommended for routine use equal to safety glasses has real merit.

Strengths

The strength of this study lies in two major areas. In the first place, the significance of the study is real. The safety of students and instructors must be of primary concern. It would appear that often such concerns as hearing which are not as observable as eyesight are not considered with the same fervor. This study calls attention to this concern and offers a practical and reasonable solution.

Secondly, the methodology of this study appears to be strong. A rather thorough approach was taken utilizing an experimental design. The social sciences are often criticized because of the lack of experimental research. Here is a case where using an experimental design was appropriate and useful.

Recommendations

One area that would have strengthened this paper would have been appropriate data on the reliability and validity of the cognitive and motor skills tests. If those tests are highly reliable and valid, then everything holds together. However, if they are not, then a concern would exist for the study in general.

EFFECTS OF THE PROBLEM SOLVING APPROACH ON ACHIEVEMENT, RETENTION, AND ATTITUDES OF VOCATIONAL AGRICULTURE STUDENTS IN ILLINOIS

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INTRODUCTION

Throughout the history of agricultural education, the problem solving approach has been recommended by agricultural teacher educators as the primary method of teaching. Several authors of agricultural education texts cite the problem solving approach as the most effective method of teaching vocational agriculture (Binkley & Tulloch, 1981; Crunkilton & Krebs, 1982; Newcomb, McCracken, & Warmbrod, 1986; Phipps, 1980). Problem solving instruction has been recommended because of the opportunities the method provides for students to develop thinking skills (Dickerson, 1984; Rogers, 1970).

Recently, some agricultural educators have questioned the effectiveness of problem solving instruction, citing changes in vocational agriculture programs and student backgrounds which have reduced the effectiveness of the problem solving approach (Moore & Moore, 1984). Others have argued that problem solving instruction results in improved learning by the students (Warmbrod, 1969), increased retention of knowledge (Binkley & Tulloch, 1981; Bruner, 1961; Crunkilton & Krebs, 1982), and better attitudes toward the teaching methods (Dawson, 1956; Phipps, 1980; Wiegers, 1961).

However, little direct empirical evidence exists to support the problem solving approach to teaching vocational agriculture. Studies conducted by Thompson and Tom (1957) and Dawson (1956) found some benefits for problem solving instruction, but were conducted prior to the expansion of vocational agriculture programs resulting from the 1963 Vocational Education Act. If agricultural educators are to continue to promote problem solving as the most effective approach to teaching vocational agriculture, a need exists to empirically examine the effectiveness of the problem solving approach in terms of the most commonly accepted measures of effective teaching - achievement, retention, and attitudes of students.

PURPOSE AND OBJECTIVES

The primary purpose of this study was to compare the effects of the problem solving approach and the subject matter approach in teaching a selected problem area in vocational agriculture. The specific objectives of the study were stated as research questions, as follows:

1. What was the effect of the problem solving approach to teaching, as compared to the subject matter approach, on the achievement of high school vocational agriculture students in Illinois?

2. What was the effect of the two teaching methods on student achievement on high level and low level cognitive test items?

3. What was the effect of the problem solving approach, as compared to the subject matter approach, on the retention of subject matter?

4. What was the effect of the two teaching methods on student retention of knowledge, as measured by performance on high level and low level cognitive test items?

5. What was the effect of the problem solving approach, as compared to the subject matter approach, on the attitudes of high school vocational agriculture students toward the method of teaching?

PROCEDURES

This study was conducted using intact groups. Therefore, random assignment of students to treatments was not possible. A quasi-experimental design, a variation of the nonequivalent control group design, was used for this study. According to Campbell and Stanley (1963), the nonequivalent control group design accounts for the main effects of history, maturation, testing, and instrumentation. Regression was not considered a threat to internal validity, since the treatments were not assigned to groups based upon extreme scores on the covariate measures.

The population for this study was Illinois high school students enrolled in an introductory vocational agriculture course. A cluster sampling technique was used to select a purposive sample from the target population. Only teachers who taught two or more introductory vocational agriculture classes were considered as possible participants in this study. The other criterion for selection was that teachers must have had prior knowledge and experience in using the problem solving approach. In order to control for overall teaching ability, teachers selected to participate in this study taught one class using the problem solving approach and one class using the subject matter approach.

The necessary sample size for each group was computed using a formula suggested by Hays (1973). Based upon an alpha level of .05, a desired power of .90, and an effect size of .66, the required sample size was determined to be 60 students per group. After telephone interviews with teachers matching the above criteria, four were selected to participate. Treatments were randomly assigned to the classes. There were 68 students in the problem solving treatment group and 61 students in the subject matter group. Due to absences during the testing period, data were collected from 66 students in the problem solving treatment group and 60 students in the subject matter treatment group.

Instruments developed by the researchers to collect data for each of the dependent variables in the study consisted of a problem area achievement test, a parallel problem area retention test, and an instrument to measure student attitude toward the teaching methods. Content validity of the achievement and retention instruments was established by a panel of experts consisting of two members of the agricultural education faculty at the University of Illinois and two high school vocational agriculture teachers. The university faculty members rated each item as either a low level or a high level cognitive item. Content validity of the student attitude instrument was established by a panel of experts consisting of two faculty members in the Department of Secondary Education and two faculty members in the Department of Vocational and Technical Education at the University of Illinois. The instruments were field tested and pilot tested for clarity and reliability using students in two vocational agriculture departments not participating in the study. The instruments were revised as a result of the pilot test and item-analysis results. The method of rational equivalence was used to estimate internal consistency, as a measure of the reliability, of the achievement and retention instruments. Kuder-Richardson 20 coefficients of internal consistency were calculated for the student achievement and retention instruments. The K-R 20 reliability coefficient for the student achievement instrument was .80, and a coefficient of .88 was calculated for the retention instrument. Cronbach's Alpha coefficient of internal consistency was .95 for the instrument measuring student attitude toward the teaching method.

A problem area in corn production was selected for this study, since corn production was included in the course of study for each of the schools selected. Prior to the beginning of the study, teachers selected to participate received inservice on the proper use of the two teaching approaches. Each school was visited during the study to verify that the proper treatments were being used in the assigned groups. The problem area achievement test and the student attitude toward the teaching method instrument were administered immediately following instruction in the problem area. The problem area retention test (a parallel form of the achievement test) was administered one week after the achievement test. In order to control for possible preexisting group differences, average grades for the first semester of vocational agriculture and student IQ scores were collected for each student to be used as covariate measures in the study.

ANALYSIS OF DATA

The data were analyzed by means of the Statistical Package for the Social Sciences (SPSS) available through the Computer Services Laboratory at the University of Illinois. Appropriate null hypotheses related to the research questions were developed and tested at the .05 level of significance. In order to determine if significant differences existed between the problem solving approach and the subject matter approach with respect to the dependent variables of student achievement and retention of acquired knowledge, multivariate analysis of covariance (MANCOVA) techniques were used to examine the data. Multivariate analysis allowed the two dependent variables to be examined simultaneously and also took into account existing correlations between the variables. Hotelling's T^2 statistic was used to determine if differences existed between the treatment groups when student achievement and student retention were considered. Univariate analysis of covariance was used as a follow-up procedure to determine the source of significant differences. Student attitude toward the teaching method was not assumed to be correlated with the covariate measures. Therefore, the student attitude variable was not included in the multivariate analysis of dependent variables.

A t-test was used to determine if significant differences in student attitude toward the teaching method existed between the treatment groups. The data were also described using measures of central tendency, measures of variance, frequencies, and percentages.

RESULTS

Demographic data were collected in order to describe the characteristics of the sample for this study. The number of years of teaching experience ranged from three to ten years ($\bar{x}$ = 5.25 years). According to the vocational agriculture teachers, approximately one fourth (24.5 percent) of the students in the study had a background in farming; over one third of the students (36.5 percent) lived in rural areas, but were not involved in farming; and approximately two fifths (39 percent) of the students lived in town. The teachers in this study indicated they used the problem solving approach to teach their vocational agriculture classes between 25 and 50 percent of the time, with the average teacher in this study using the problem solving approach slightly over one third of the time (36.25 percent).

Findings Related to Covariate Measures

A t-test was performed to examine differences in the means for average grades and IQ. Both average grades in vo-ag and IQ scores were found to be significantly different for the two groups ($p < .05$ and $p < .10$, respectively), supporting the need for analysis of covariance techniques.

Findings Related to Student Achievement

A multivariate analysis of covariance was performed on student scores for the Problem Area Achievement Test and the Problem Area Retention Test. Hotelling's T^2 statistic was .041, F (2,121) = 2.50, p = .08., indicating there was no difference at the .05 alpha level between the treatment groups when student achievement and student retention were considered simultaneously.

Student achievement was measured by the number of correct responses on the 25-item Problem Area Achievement Test developed by the researcher. Due to pre-treatment differences between the groups, the mean scores for student achievement were adjusted using the covariate measures. Summary statistics for student performance on the Problem Area Achievement Test are presented in Table 1.

For total scores on the Problem Area Achievement Test analysis of covariance found no significant difference between students taught by the problem solving approach and students taught by the subject matter approach, F (1,122) = 1.59, p = .21. Therefore, the hypothesis of no difference was not rejected.

Table 1

Mean Student Achievement for Problem Area Achievement Test by Teaching Method

		Total score		Low level items		High level items	
Teaching method	n	Observed $\bar{x}$	Adjusted $\bar{x}$	Observed $\bar{x}$	Adjusted $\bar{x}$	Observed $\bar{x}$	Adjusted $\bar{x}$
Problem solving	66	13.59	13.13	9.55	9.20	4.05	3.92
Subject matter	60	13.38	13.85	9.10	9.44	4.28	4.40

The results of the analysis of covariance for student achievement on low level cognitive items indicated no significant difference between students taught by the problem solving approach and students taught by the subject matter approach, F (1,122) = 0.28, p = .62. The researchers failed to reject the hypothesis of no difference between the treatment groups.

Similar results were found for achievement on high level cognitive items on the Problem Area Achievement Test. Observed means and means adjusted for the two covariate measures for the nine high level cognitive items are presented in Table 1. Analysis of covariance showed no significant difference for high level cognitive achievement between treatment groups, F (1,122) = 3.65, p = .06. Therefore, the hypothesis of no difference between the teaching methods was not rejected.

Findings Related to Retention of Knowledge

Two measures of retention of acquired knowledge were used in this study: (a) the number of correct responses on the 25-item Problem Area Retention Test and (b) achievement loss, or the difference between student scores on the Problem Area Achievement Test and scores on the parallel Problem Area Retention Test. Student scores on the retention test were adjusted using the covariate measures of average grade in vocational agriculture and IQ scores. Summary statistics for student performance on the Problem Area Retention Test are presented in Table 2.

Table 2

Mean Student Retention for Problem Area Retention Test by Teaching Method

		Total score		Low level items		High level items	
Teaching method	*n*	Observed $\bar{x}$	Adjusted $\bar{x}$	Observed $\bar{x}$	Adjusted $\bar{x}$	Observed $\bar{x}$	Adjusted $\bar{x}$
Problem solving	66	12.24	11.89	8.02	7.75	4.23	4.14
Subject matter	60	10.90	11.25	7.27	7.53	3.63	3.73

Univariate analyses of covariance were used to test the hypotheses of no difference in student retention between the two methods for total score, low level cognitive items, and high level cognitive items on the Problem Area Retention Test. For total scores on the Problem Area Retention Test the F statistic was not significant at the .05 alpha level, F (1,122) = 0.72, p = .40. The hypothesis of no difference in total retention scores of students between the methods was not rejected. For low level cognitive items, analysis of covariance indicated no significant difference between the students taught by the problem solving approach and students taught by the subject matter approach, F (1,122) = 0.19, p = .66. Similar results were found for student scores for high level cognitive items on the Problem Area Retention Test. The F statistic was not significant at the .05 alpha level, F (1,122) = 1.15, p = .22. Therefore, the hypotheses of no difference in retention for low level or high level cognitive items between the methods was not rejected.

As shown in Tables 1 and 2, students in the subject matter treatment group had slightly higher adjusted mean scores on the Problem Area Achievement Test than students in the problem solving treatment group. However, the reverse was true for the Problem Area Retention Test, with students in the problem solving group earning higher adjusted mean scores than students in the subject matter treatment group. While the differences between the groups were not significant for either achievement or retention, this reversal indicated a lower achievement loss for students in the problem solving treatment group.

Analysis of variance was performed for achievement loss on the adjusted mean scores for the two groups to determine if the difference in achievement loss was statistically significant. When the total test scores was considered, there was a significant difference in achievement loss in favor of the problem solving treatment group, F (1,122)= 4.40, $p < .05$. The hypothesis of no difference in achievement loss between students taught by the problem solving approach and students taught by the subject matter approach was rejected.

For low level cognitive items, achievement loss for the problem solving group was slightly lower than for the subject matter group. Analysis of variance indicated there was no significant difference in achievement loss for low level cognitive items between the groups, F (1,122) = 0.84, $p = .36$. The hypothesis of no difference was not rejected.

However, for high level cognitive items, students in the problem solving treatment group scored slightly higher on the retention test than on the achievement test, resulting in an achievement gain. Students in the subject matter treatment group earned lower scores for high level cognitive items on the retention test than on the achievement test. An analysis of covariance was performed to determine the significance of the difference between the means for high level achievement loss. The F test indicated a significant difference between the treatment groups, F (1,122 = 6.79, $p < .01$, indicating that for high level cognitive items, students taught by the problem solving approach had less achievement loss than students taught by the subject matter approach. Therefore, the hypothesis of no difference was rejected.

Findings Related to Student Attitude Toward the Teaching Method

Student attitude toward the teaching methods examined in this study was measured by student responses on the 24-item Attitude Toward Teaching Method instrument developed by the researchers. Students were asked to respond to each item on a Likert-type scale which ranged from Strongly Agree to Strongly Disagree. Responses were assigned weights ranging from five points (for Strongly Agree) to one point (for Strongly Disagree). Negatively stated items were reverse scored. The maximum possible score on the attitude instrument was 120. Student scores on the attitude instrument ranged from 32 to 112. Summary statistics for student attitudes toward the teaching methods are presented in Table 3.

Table 3
Mean Scores for the Attitude Toward Teaching Method by Teaching Method

Teaching method	*n*	$\bar{x}$	SD
Problem Solving	66	77.14	15.86
Subject Matter	60	72.45	17.29

A t-test was used to test the hypothesis of no difference in student attitudes toward the teaching methods examined in this study. There was no significant difference in student attitude between students taught by the problem solving approach and students taught by the subject matter approach, $t\ (124) = 1.59$, $p = .12$. Therefore, the hypothesis of no difference was not rejected.

CONCLUSIONS

Based upon the findings of this study, the following conclusions were drawn:

1. The problem solving approach is no more or less effective than the subject matter approach in producing gains in student achievement, regardless of the cognitive level of the questions.
2. The problem solving approach is no more or less effective than the subject matter approach in producing higher scores on the delayed retention test, regardless of the cognitive level of the questions.
3. Students taught by the problem solving approach retain more acquired knowledge than students taught by the subject matter approach. Especially for high level cognitive items (which require application, analysis, synthesis, or evaluation), students taught by the problem solving approach exhibit lower achievement loss than students taught by the subject matter approach.
4. Students' attitudes toward the problem solving approach are slightly more positive than students' attitudes toward the subject matter approach, but the difference is not great enough to be considered statistically significant.

RECOMMENDATIONS

Based upon the findings and conclusions in this study, the following receommendations are offered:

1. Because of the superiority of the problem solving approach in the area of student retention of knowledge, the problem solving approach should be used more extensively to teach introductory vocational agriculture courses.
2. Studies of similar purpose and design with a variety of problem areas and students from both rural and urban backgrounds should

be conducted in vocational agriculture classrooms to increase the generalizability of the findings of this study.

3. Additional studies should be conducted to determine the effect of the problem solving approach on retention over longer periods of time.

4. Studies involving students in advanced vocational agriculture courses (11th and 12th grades) should be conducted to determine the effectiveness of problem solving instruction in improving problem solving and decision making skills.

5. The problem solving approach should be examined over a much longer period of time to determine if student achievement and attitudes toward the teaching method change with increased experience in using the problem solving approach.

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Effects of the Problem Solving Approach on Achievement, Retention, and Attitudes of Vocational Agriculture Students in Illinois
A Critique

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This study examined the effects of using the problem solving approach and the subject matter approach in teaching a selected problem area. The problem solving approach has been promoted heavily for use in vocational agriculture classrooms and its effectiveness needed to be evaluated.

The researchers are to be commended for their thoroughness in designing the study. It was apparent that much time was spent preparing and analyzing the survey instruments. It would have been helpful to the reader if the rational for administering the retention test only one week after the achievement test was explained. Is there research evidence to indicate that this amount of time is sufficient to test the retention of knowledge? If the items on the tests were classified by cognitive level, could objectives 1 & 2 and 3 & 4 have been combined? The reviewer would have found definitions of 'low' and 'high' level to be useful in understanding how they were defined by the researchers.

It is my interpretation of the paper that the two groups were composed of students from all of the schools in the study. The conclusion that there were no differences between the treatment groups appears to be somewhat shaky. Wouldn't the inclusion of location in the ANOVA have clarified this point? The use of first semester vocational agriculture grades and IQ as covariate measures may not be appropriate. Research has indicated that vocational agriculture grades are sometimes inflated and that GPA rather that IQ is a better predictor of academic achievement. The use of these covariate measures to adjust mean scores may have created significance where it did not exist.

The basis for recommending that the problem solving approach be used seems to rest upon the fact that the students involved with this method scored higher on the Retention Test than on the Achievement Test for high level cognitive items. This increase in learning was not addressed in the study. It would certainly appear that some outside factors were influencing these scores. Using a longer period of time between the administration of the two tests may help with this problem.

The recommendations by the authors that additional studies be conducted seem very appropriate. Many questions seem to remain as to the effectiveness of using problem solving as an instructional technique. Using a larger sample size and students from a variety of classes would certainly strengthen the conclusions drawn by this study.

EXPRESSED SATISFACTION WITH THE NOMINAL GROUP TECHNIQUE AMONG SELECTED AGRICULTURAL POLICY MAKERS AND CHANGE AGENTS

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INTRODUCTION

The Nominal Group Technique (NGT) has been widely used as a tool for identifying and solving problems in agriculture, business, churches, social research, education, health and medicine, and the military service (1,2,3,4, 6,7,8,9,10,11,12,13,14,16,17,18,19,20,22). It has been perceived that educators, change agents, and administrators active in change need a tool like the NGT if they are effectively to foster commitment to change.

Identifying priorities relevant to both the real and perceived needs of conference participants necessitates innovation and creativity in a conference program. One way to maximize participation, (and thus innovation, creativity, and commitment), is to use a structured small group process. It may be theorized that if individuals are involved in the process of identifying problems, then they may express more interest and receive greater personal satisfaction from being involved in that process.

It stands to reason that no matter how effective a technique may be for identifying problems or concerns, for extablishing priorities, or for solving problems, the satisfaction of the people involved in the process will affect their commitment to and support for any follow-up activities that may occur. However, it was not known if participants in the NGT would express personal satisfaction as a result of such participation, and thus, be committed to act according to the consensus of the group. An extensive literature review did not reveal any studies that measured the expressed satisfaction of participants with the use of NGT to reach a consensus by a group.

PURPOSE AND OBJECTIVES

The purpose of this study was to determine whether or not change agents, with differing professional backgrounds and responsibilities, who participated in the structured process of a nominal group in the setting of diverse decision-making and problem-solving conferences, would express personal satisfaction with the technique used.

It was theorized that participants in the NGT would express satisfaction with such an activity. This study was designed to test hypotheses relating to the nominal group usage. Data, from which the hypotheses were tested, were obtained through a survey of participants in nominal groups at two conferences.

Hypotheses

The following null hypotheses were tested, using data from surveys of NGT participants:

1. Within a conference, there would be no difference between those with previous participation in an NGT and those without previous participantion as regards their expressed satisfaction with an NGT.

2. Within a conference, there would be no difference between those expressing an understanding of the purpose of the NGT and those not expressing an understanding of the purpose of the NGT as regards their expressed satisfaction with an NGT.

3. Within a conference, there would be no difference between participants on the basis of their profession with respect to expressed satisfaction with an NGT.

Definition of Terms

For the purpose of this study, "satisfaction" was defined as "the adequate fulfilling of a need," as expressed by participants in nominal group activities. "Change Agent" was defined as a "process helper and knowledge linker" (5:2), within the context of the meaning given by Rogers and Shoemaker (15) of "A professional who influences innovation-decisions in a direction deemed desirable by a change agency," and included persons such as principals, professional educators, and extension and administrative personnel in agricultural development. "Conference," as used in this study, was taken to mean a meeting together of more than five persons for the purpose of solving a problem or making a decision. "Consensus" was used to mean the judgment arrived at by most of those concerned (21).

PROCEDURES

Two unique conferences at Texas A&M University, involving training and decision-making, and concerned with different clienteles, held potential for examining the expressed satisfaction of participants with the Nominal Group Technique as a tool for identifying and solving problems. Problem-solving sessions held during the conferences provided an excellent opportunity to test the hypotheses presented above.

Description of Conferences Studied

The International Conference on Food and Water (May, 1985)

Conference participants included more than two hundred ranking policymakers, educators, administrators, and change agents from around the world. Trained NGT facilitators conducted the NGT sessions, involving approximately 178 persons, to formulate a consensus of opinion regarding the priority of issues in water and food policy. The next day, 110 conferees present who had participated in the nominal groups (62% of the 178) were surveyed to determine their satisfaction with the NGT. The measurement reflected only the conferees' perceived satisfaction with the NGT, as used at the conference.

Texas Agricultural Extension Service District Conference. (April, 1986)

This conference was planned as an in-service training conference for the 60 extension agents of Texas District 10. As part of the training on teaching adults, the NGT was used to enable the participants to identify problem areas of working with adults. Following the group activities, participants were surveyed as to their expressed satisfaction with the NGT.

Implementation of the NGT

Trained NGT facilitators conducted the NGT sessions at both conferences, using the standard NGT procedure (3,13), which includes the following steps: (1) Silent generation of ideas, (2) Round-robin recording of ideas, (3) Clarification and discussion of ideas, (4) Individual voting on the importance of ideas, and (5) Final voting to determine the group consensus.

Instrumentation

Twenty-two-to-twenty-five item "satisfaction scales" were administered to the participants in each conference. The instrument consisted of five biographical background questions and seventeen to twenty, five-point, Likert-scale statements on the conferees' attitudes toward the Nominal Group Technique. The instruments were developed with the assistance of faculty and graduate students at Texas A&M University and Dr. John Hoyle (8), who has consulted and published on the use of nominal groups in educational settings. Statement responses ranged from 1, "Strongly Agree," to 5, "Strongly Disagree."

ANALYSIS OF DATA

Primay analyses were concerned with the independent variables:

1. Previous use of NGT
2. Understanding of the purpose of the NGT
3. Background and profession of participants

The statements making up the dependent variables were grouped into indicative constructs of "Personal Involvement in the NGT" and "Usefulness of the NGT," which were used collectively as an index of expressed satisfaction. Phi, Pearson, and Point Bi-Serial correlations were performed on the discreet data to test expressed satisfaction with NGT as affected by the independent variables, as well as by interactions with other dependent variables. Descriptive statistics, such as frequency counts, were used to present the distributions of responses to the various items, and groupings of items on the opinionaires.

RESULTS

The presentation and discussion of the data are arranged into two major sections. The first section describes the data of the conferences and the second section presents elements shared by the conferences which relate to the overall purpose of this study.

Data From the Two Conferences

The survey instruments used in the two conferences were very similar and a merging of the significant data resulting from the conferences yielded some useful information with respect to the hypotheses tested. Theoretical constructs in each conference were used as indicators of expressed satisfaction with nominal groups and provided a means of comparison among the conferences with regard to the null hypotheses. For each of the conference results, theoretical constructs used to summarize and compare the data are presented below.

Water and Food Policy Conference: the construct "Usefulness of the NGT" was the mean response to three statements on the instrument. This construct is an indicator of expressed satisfaction with the nominal group technique and indicated a mean strong agreement with statements reflecting satisfaction with nominal group activities. "Personal Involvement in the NGT" was from nine statements. This construct reflected the mean response to statements concerning personal satisfaction with how the NGT was perceived.

Extension Service conference: "Usefulness of the NGT" was the mean response to four statements on the instrument: "Personal Involvement in the NGT" was from five statements.

The International Conference on Food and Water

Most participants did not indicate prior NGT or Delphi experience, did not consider themselves policy makers, and considered themselves fluent in English.

There was a significant relationship between the status of policy-maker/ non-policy-maker and previous experience/no previous experience with nominal groups or Delphi technique, indicating that policy makers did not perceive themselves as having previous experience with a consensus-generating technique, or that those non-policy-makes indicated that they did have previous experience with nominal groups or the delphi technique.

Ninety-five participants (87%) expressed that they had been skeptical of the use of NGT and yet most participants expressed satisfaction with group size and agreed that group consensus is more effective than with individual action alone.

The following findings were significant at the .05 level: Those with no previous experience with nominal groups did agree in the following ways: (1) they agreed with the purpose of the nominal groups; (2) they believed their personal opinions to be better than the consensus reached by their nominal group; (3) they would not try to persuade others to act according to their group's consensus; (4) they believed the group to be aided by their contribution; and (5) they were committed to work according to the group's consensus.

The following findings were significant at the .05 level: those participants stating that they were policy makers indicated that they did feel their opinions to be made known in the groups; they were not committed to work according to the group's consensus, but they did indicated believing that more attention should have been given to representatives from lesser-developed countries. Those indicating complete fluency in English indicated that they did not understand the purpose of the NGT; they would not use it in the future; they felt the group to have been helped by their personal contribution; they would not try to persuade others to act according to the consensus reached by the group, even though they themselves were committed to work by the group's consensus; they did not believe that the world food situation would improve if they acted according to their group's consensus; and they did not believe that working in a group to arrive at a consensus in problem-solving was more effective than their working alone.

Texas Agricultural Extension Service

Almost all of the participants were extension agents who had previously participated in group planning and decision-making activities, and who understood the purpose of NGT. Most of the participants expressed lack of satisfaction with the quality of participation in previous extension group activities. Exactly half of the participants had previous experience with NGT.

Significant relationships at the .05 level from the Phi, Pearson, and Point Bi-Serial correlations were that Extension agents understood the purpose of NGT, and that those with previous experience in group decision-making activities understood the purpose of the NGT. Extension agents felt that their opinions were valued more in the NGT than in their previous non-NGT group activities, and felt more able to express themselves than in previous group activities. They agreed with the purpose of the NGT and felt that the NGT was more satisfactory and would be more useful than some other non-NGT activities.

Previous participation in the NGT did not appear to have a significant relationship with any of the attitude items.

Those who understood the purpose of the NGT indicated that they agreed with the purpose of the NGT.

Elements Shared by The Conferences

Organizers of each of the conferences conducted their nominal groups in slightly different ways for different purposes. Therefore, each required a different survey instrument to measure participants' expressed satisfaction with the nominal group process used in that conference. Following is a description of each of the elements common to each of the measurements, with a presentation of the relevant data, as related to the three hypotheses tested.

Each instrument attempted to categorize participants according to profession: Policy Maker vs. Non-Policy Maker (Water and Food Policy Conference), and Extension Agent vs. Extension Specialist or Supervisor (Extension Service Conference). Profession of participant had no significant relationship to any of the attitude constructs in the Water and Food Policy Conference. Extension agents did not show significantly more satisfaction with the NGT used than did the non-agents.

The two theoretical constructs for comparing mean attitudes of Usefulness of the NGT and Personal Involvement in the NGT between the two conferences are presented in the matrix below.

Figure 1.

Comparison of Mean of Responses to Constructs of Attitude Items at Two Conferences Using Nominal Groups on a Scale of 1-5*.

Construct	Conference	
	International Conference	Extension Service Conference
Usefulness of the NGT	2.6	1.8
Personal Involvement in the NGT	3.0	2.2

*1 = Strong Agreement, 3 = Neutral in Agreement, 5 = Strong Disagreement

The number value represents the mean expressed attitude, on a Likert scale of one to five of the constructs. The Extension Service participants expresssed much more agreement with the relative usefulness of the NGT as well as their personal involvement in the NGT.

CONCLUSIONS

From an analysis of the data collected, certain conclusions can be drawn about NGT and the satisfaction with its use expressed by those participating in it.

1. There was no significant ($p < .05$) difference between those who had previously participated in an NGT and those who had not, as regards their expressed satisfaction with an NGT; therefore null hypothesis one was not rejected.

2. Those who understood the purpose of the NGT tended to express greater satisfaction with the NGT than those who indicated that they did not understand the purpose of the NGT; thus, null hypothesis two was rejected.

3. There was no significant ($p < .05$) difference between the profession of Extension Service Participants with respect to expressed satisfaction with NGT; null hypothesis 3 was not rejected. There was a significant difference between the profession of International Conference participants with respect to expressed satisfaction with NGT; null hypothesis 3 was rejected. The two conferences did reflect different populations. Participants in the Extension Service conference were fairly homogeneous in education, experience, and professional ethos. On the other hand, participants in the Internatioal Conference were different in nationality, culture, education, experience, and profession.

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Expressed Satisfaction with the Nominal Group Technique Among Selected Agricultural Policy Makers and Change Agents
A Critique

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The introduction in this research paper was presented in a style which clearly developed the problem and hypotheses outlined. The initial statement was documented by a seemingly exhaustive bibliographical list. A greater amount of credibility would have been established regarding the research design and subsequent hypotheses, had the list of 22 references been utilized through a more meaningful and interwoven review of literature. Although each of the three hypotheses measured the expressed satisfaction with utilizing the Nominal Group Technique (NGT), the rationale for satisfaction was not sufficiently addressed in the study. In the introduction of this manuscript, the author suggests those active in change need a tool such as NGT to effectively foster commitment to change. The assumption was made that satisfaction of the people involved is a prerequisite to implementing a technique utilized for identifying problems or concerns, establishing priorities, or for solving problems. Although the hypotheses tested differences between previous participation in the NGT, understanding of the purposes of NGT, and expressed satisfaction based on participants' profession, the purpose of the study was to determine whether or not change agents with varying degrees of the aforementioned characteristics would express personal satisfaction with the technique used. It therefore would have been appropriate if additional descriptive statistics had been incorporated in the analyses of data. Additional statistics reported in this area could have demonstrated the degree of satisfaction (regardless of differences) since many dependent variables, such as degree of individual success experienced in group discussion, outcome of discussion sections, etc., may have impacted the participants' expressed degree of satisfaction.

Two conferences were targeted by this research effort. Although the manuscript indicates the survey instruments used in the two conferences were similar, there were questions as to why there were differences and if a merging of the significant data in fact enabled the researcher to test the hypotheses in an unbiased manner. It would have been well for the writer to expound on this discrepancy in the manuscript.

This study involved a great deal of preparation and coordination. The researcher is to be complimented for detailed organization in this investigation. Conclusions were drawn based on the testing of hypotheses outlined. Since the purpose of the study was to analyze personal satisfaction with using the Nominal Group Technique, and Hypotheses One and Three were not rejected, additional conclusions and the incorporation of recommendations would have been appropriate. Questions were left in the mind of this reader. For example, does the researcher still have the same apparent support for the NGT now as compared to his bias prior to the study?

FACTORS AFFECTING PRACTICAL AGRICULTURAL TRAINING EXPERIENCES FOR GRADUATE STUDENTS FROM DEVELOPING COUNTRIES

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INTRODUCTION

Many universities in the United States, particularly the land grant institutions, have prided themselves on providing practical and relevant training for students, regardless of nationality or background. Consequently, there is an awareness among some educators of the need to be active in monitoring the practical aspects of educational experiences that students receive. Historically, practical training is closely associated with the field of experiential education. By definition, learning that is experiential in character involves the learner in a direct encounter with the phenomenon being studied rather than merely observing or thinking about it (Keeton & Tate, 1978).

In recent years, there has been a growing number of international students attending colleges and universities in the U.S. A nation-wide study was conducted by Lee (1981) to assess the perceived needs of students from developing nations. Lee found that one of the least met needs was for practical experience during the international student's stay in the U.S. Other research adds support and clarification to Lee's claim (e.g. Levitov, 1982 & Limbird, 1981).

According to a recent publication, 40% of graduate agricultural degrees in the U.S. in 1982 were awarded to international students. Many international students come to the United States, according to the publication, with very adequate qualifications in the formal aspects of their disciplines, but the students lack experience gained from practical situations that promote confidence and competence in their intended professions (Mashburn & Van de Water, 1984).

It should be noted that some international students in the U.S. have found opportunities to participate in practical learning experiences such as a supervised observation, internship, or salaried employment. In addition, some find opportunities to be involved in practical experiences associated with laboratory assignments, research projects, and graduate assistantships. However, there is a body of literature and research-based evidence to indicate that increased practical training experiences, especially in agriculture, are needed for students from developing countries. Some kinds of practical agricultural experiences suggested in the literature involve students interacting with farmers and agribusiness workers to observe the management of problems encountered as part of the daily work situation.

One challenge facing colleges and universities lies in the area of discovering appropriate and effective ways to design and implement practical training experiences for the maximum benefit of international students, employers, and other involved parties. Those institutions which want to implement new programs or expand their current offering of practical training experiences for international students need to have proven models of experiential education. The field of secondary vocational education is one logical place to begin the search for useful and proven models. In particular, Vocational Agriculture instructors have had extensive experience in conducting supervised occupational experience (SOE) and cooperative educational programs. In one of the standard vocational education textbooks, Mason, Haines, and Furtado recommended that a survey of two audiences be conducted prior to implementation of any practical experience program: (1) the student learner audience and (2) the representatives of the community of employers (or other potential providers of practical experiences) (1981, p.144). Consistent with this advice, a good beginning point for faculty members and college administrators interested in implementing new programs or expanding current offerings would be to commission a comprehensive survey of audiences who have potential involvement in practical training experiences for international students.

PURPOSE AND OBJECTIVES

This study was designed as a response to the need identified by international students for more experiential learning opportunities. The purpose was to examine the factors affecting agricultural training experiences for graduate students from developing countries who are studying at colleges and universities in the United States. Practical agricultural training experiences were defined as the training that a student receives through a jointly designed, monitored, and evaluated program in conjunction with the college or university academic advisor and members of the agricultural community (NAFSA, 1982). Placement in all three areas of practical training (supervised observation, internship, salaried employment), or a combination of the three areas, were considered as potential practical agricultural training experiences for purposes of this study.

Five groups were identified from within a strategically selected survey population in Michigan to supply attitudinal responses and information on a mail questionnaire. Attitudes of respondents toward various aspects, problems, terms, and conditions related to practical experiences were measured. The two primary questions that guided the research process and the related approach to measurement selected for this study were:

1. What are the attitudes of members of the survey population and members of the five groups regarding factors affecting, and potential benefits of, a practical training experience?

2. What are the significant differences in attitude between members of the five groups regarding factors affecting, and potential benefits of, a practical training experience?

PROCEDURES

The five groups in the survey population were: (1) graduate students from developing countries enrolled in agriculture programs in six departments at Michigan State University (MSU), (2) faculty advisors of the graduate students from developing countries, (3) Michigan Cooperative Extension Service (CES) field agents with agricultural responsibilities, (4) Michigan CES county extension directors (CEDs), and (5) Michigan Vocational Agriculture (Vo-Ag) instructors. All individuals identified as part of the survey population were included in the sample. This total enumeration approach was chosen because of the inadequate number of individuals that would have remained, if a reduction in sample size had occurred, in some of the subgroups necessary for the desired breakdown statistical procedures.

A four part questionnaire was developed for the study. A Likert-type scale with a five-point range (strongly disagree, disagree, undecided, agree, strongly agree) was used to measure respondent reactions to 25 individual questionnaire items that reflected attitude objects. A panel of expert judges was selected to provide a thorough examination of the questionnaire. The panel of judges clustered each of the 25 questionnaire items into one of three composite benefit groupings to provide separate attitude scale measurements for use in data analysis. A group of respondents, similar to members of the five survey population groups, was chosen to complete a pre-test version of the instrument. The Spearman-Brown split-half correlation coefficient on the pre-tested questionnaire was .78. A post-hoc factor analysis was performed in order to identify items that did not load into one of the three composites identified by the judges. The three categories of attitudes included in the composites measured were:

1. **Student benefit composite:** Attitudes toward aspects of a practical training experience that would give overall benefit primarily to the international students.

2. **Michigan State University benefit composite:** Attitudes toward aspects of a practical training experience that would give overall benefit primarily to the individuals or institutions associated with MSU.

3. **Community benefit composite:** Attitudes toward aspects of a practical training experience that would give overall benefit primarily to individuals or institutions in a local agricultural community in the U.S.

There were 473 questionnaires mailed to eligible members of the survey population on January 15, 1986. Two follow-up mailings were used to improve the return rate. By the final survey acceptance date, March 13, 1986, a total of 426 usable questionnaires had been returned to produce a 90% rate of return.

ANALYSIS OF DATA

Data from the 426 usable questionnaires were prepared for analysis using a microcomputer statistical analysis software package. Response frequencies and measures of central tendency and dispersion were generated for respondents on each individual questionnaire item and the three composite groupings.

All items from the questionnaire that provided for response on a Likert-type attitudinal scale were interpreted and analyzed at the interval level. Analysis of Variance (ANOVA) tests were utilized to compute F statistics. Statistical t-tests were performed to indicate significant differences between any two respondent group or subgroup mean scores. The .05 level of significance with an accompanying 95% confidence level was used. It should be noted that there is disagreement discussed in the literature concerning the appropriateness of applying statistical tests of significance to nonprobability samples. Nachmias and Nachmias (1976) provided an overview of the arguments offered and the rationale that exists on both sides of the controversy.

Because each questionnaire was coded for respondent identification, it was possible to perform statistical analysis that addressed the problem of nonrespondent bias. Comparison of selected situational and demographic frequencies computed from each of the respondents with available data from the nonrespondents revealed no major differences.

FINDINGS

Scores from the student, MSU, and community benefit composites, presented in Table 1, indicated the following:

Finding No. 1: Each respondent group demonstrated a positive attitude toward practical training experiences. All composite mean scores for the total group and each of the five respondent groups were between the "Strongly Agree" to "Undecided" range.

Finding No. 2: Faculty members had the least positive attitude, of all respondent groups, toward practical training experiences. Faculty mean scores were significantly lower than the student group on every benefit composite and 21 out of the 25 individual questionnaire items. In addition, the faculty group demonstrated a lower attitude than the CES field agent, CED, and Vo-Ag instructor groups on all but one of the benefit composites. Faculty members also had consistently higher standard deviation scores than each of the other four groups.

Table 1. Attitude toward involvement by composite scores in Part I

Composite Description	Faculty (n=77) mean SD	Student (n=108) mean SD	CES (n=63) mean SD	CED (n=73) mean SD	VOAG (n=105) mean SD	F statistic	Level of significance
Total of all 25 items	3.413 .478	3.844 .349	3.609 .342	3.693 .343	3.654 .376	16.589	.001
Benefit to student	3.624 .577	4.086 .387	3.902 .309	3.911 .360	3.955 .349	14.469	.001
Benefit to MSU	3.417 .649	3.976 .524	3.589 .419	3.729 .401	3.654 .502	14.366	.001
Benefit to community	3.050 .441	3.594 .419	3.216 .448	3.307 .419	3.257 .477	18.080	.001

Scale: 1=SD 2=D 3=U 4=A 5=SA (scores for negative items were reversed)

Finding No. 3: International students had the most positive attitude, of all the respondent groups, toward practical training experiences. Student mean scores were significantly higher than each of the other four groups on each of the benefit composites.

Finding No. 4: The CES field agents, CEDs, and Vo-Ag instructors had very few differences in attitude toward practical training experiences. Scores for the three agricultural and extension educator groups were remarkably similar for each of the four benefit composites as well as for 20 of the 25 individual questionnaire items. Vo-Ag respondents were shown to have a significantly higher attitude on one item--the public relations benefit of being involved in a practical training experience.

Finding No. 5 : Students would receive the most benefit and the host community would receive the least benefit from participation in practical training experiences. Benefits to the student, agreed upon by each of the five groups, were: increased understanding of the U.S., management training, increased professional advancement when the student returns home, and application of classroom theories. All respondents, except for student group members, down-played the technical and professional contribution that the student trainee could make while in the community. In addition, all respondent groups minimized the potential for the local agricultural community to make contacts that could result in more international trade opportunities.

CONCLUSIONS AND RECOMMENDATIONS

A statement of major study conclusions accompanied by a brief discussion, possible implications, and recommendations is presented in this section. The reader should note that because the study design was based on a survey population that represented only one non-randomly selected segment of a much larger target population, the degree to which the conclusions can be generalized to broader situations is limited.

Conclusion No. 1: The lower mean scores of the faculty group, and the amount of variance between members of the group, may indicate that the process of securing involvement in facilitating practical training experiences for their advisees will be more problematic than was suggested in a recent study. Levitov (1982) concluded that, based on positive responses to items in a questionnaire he administered, that faculty members would be willing to become involved in various aspects of practical experiences. He said that "faculty involvement will grow as efforts in designing, monitoring and evaluating trainees are increasingly recognized by department heads and deans" (p.16). The findings of this study raise serious concerns regarding the faculty willingness, at least for those in the college of agriculture that were included in the survey population, to make the changes that might be necessary to increase practical training opportunities for international students.

One possible implication emerging from this conclusion, is that the land grant philosophy, as currently understood and practiced by faculty respondents, does not necessarily embrace the principles of experiential education. One reason for the high level of variance reported among faculty advisors may be attributable to differing definitions, interpretations, and levels of adoption of principles of the land grant philosophy.

Lionberger (1979), in a study indirectly related to this discussion, constructed an "ideal type" that included 16 major concepts that represented the land grant university ideal. The items were presented to selected faculty members at a land grant university. Faculty respondents indicated the degree of acceptance or rejection of each concept. When results were tabulated, the total deviation by the faculty from the land grant ideal was found to be small. However it was found that the way in which the deviation occurred had important implications for how the faculty members were likely to perform their professional role. In order to test the areas of deviation more specifically, Lionberger arranged 9 major concepts on a theory-to-practice continuum. It was found that "deviations became distinctly greater from the theoretical to the practical end of the continuum" (p.55). Lionberger concluded that the "general inclination of the faculty was to support knowledge development at the theoretical level nearly equal to the ideal followed by a progressive decline of support along the theory-to-practice continuum" (p.184). Of most significance to this study, Lionberger found that experiences that had occurred during a faculty member's graduate training had the most influential impact on a faculty member's acceptance of land grant concepts at the practical end of the theory-to-practice continuum. He recommended that "a different kind of graduate school experience is needed...this could be achieved by encouraging voluntary affiliation of graduate students with religious and civic agencies or more formally through regularly assigned and carefully supervised experiences in social service activities during the graduate study. It was quite evident that a Ph.D. degree from an alleged land grant university did not suffice" (p.193).

Perhaps by limiting graduate student programs to activities that are primarily at the theoretical, rather than the practical, end of the theory-to-practice continuum, we are creating among both both foreign and American students an improper understanding of the way land grant universities should operate. It is recommended that further research be conducted to investigate the connection between the land grant philosophy held by faculty members and the type and extent of practical experiences encountered during their graduate training.

Conclusion No. 2: The trainer or employer who could host an international student during an experience must be convinced of some benefits that could accrue to the host. Certain benefits that make internships for American students attractive to employers, such as possible recruitment and retention of permanent employees, rarely exist with international student participants who intend to return home following completion of their degree programs. It is recommended, therefore, when planning programs of practical training for international students that this aspect be given primary consideration.

Conclusion No. 3: The CES field agents, CEDs, and Vo-Ag instructors are in a position to provide a linkage between the university academic community and the local agricultural community in the U.S. It might be a good strategy to provide professionals in each of these three groups, especially those that expressed a moderate or high interest in international involvement, with opportunities such as international in-service training, overseas short-term work assignments, and professional incentives. Perhaps facilitating the placement and supervision of an international student in a practical training experience could be one component of a complete international involvement package. It is recommended that more international training and short-term international development opportunities be offered for members of the agricultural and extension education professions.

Conclusion No. 4: By strongly endorsing the experiential education concepts and emphasizing the need for increased practical training experiences, graduate student from developing countries are not asking for preferential treatment and special services that are not already accorded to domestic students. Rather, they are assuming that the domestic students are acquiring practical experiences in conjunction with their educational programs in ways that aren't as easily accessible and readily available to the foreigners during their professional preparation. Interpreted correctly, the major appeal is for equal treatment and equity in educational programming. It is recommended that the extent and effectiveness of practical experiences that international students receive, in comparison to their American counterparts, be dealt with in future studies.

A final recommendation is that administrators and faculty in colleges of agriculture should communicate with sponsors of international student programs, particularly USAID/USDA officials, in order to understand the impact that increased awareness and perceived student need for practical training may have on future international student enrollment in the U.S.

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Factors Affecting Practical Agricultural Training Experiences for Graduate Students from Developing Countries
A Critique

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The Steele-conducted study of factors affecting practical training experiences provided for international students is important. All of our students need and can profit from application as well as theoretical instruction. The strenths of this study include instrument development and data collection. A 90 percent return was achieved.

Five respondent groups were surveyed for the purpose of assessing their attitude toward factors affecting, and potential benefits of, a practical training experience in the first place and what the significant differences between these five groups are regarding these matters.

International students had the most positive attitude of all respondent groups toward practical training. Extension agents and their administrators, together with vocational agriculture teachers, were in close agreement. Faculty were least favorable of the five groups and had the most variance among members of that group. The author attributed the lower faculty evaluation of practical experience to a lack of land grant philosophy. A lack of time and resources are other possibilities for such an attitude by those responsible for instructional programs. The weakness of this study has to do with its potential value to other land grant institutions. The lack of descriptive information for the international students and for six departments involved precludes generalization. Even without access to information describing international students for the United States, description of those in his accessable population would have enabled me, with the knowledge of such students on my campus, to make appropriate inferences.

In summary, the study is important and the findings have practical value.

FACTORS AFFECTING THE DIFFUSION/USE OF AN ON-LINE DATABASE SYSTEM (AGRIDATA) FOR INSTRUCTION IN VOCATIONAL AGRICULTURAL PROGRAMS IN NEW YORK STATE: PHASE I--A CASE STUDY APPROACH

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INTRODUCTION

Large scale databases provide readily accessible real time information and communication services for use in the agricultural education instructional program. Real time information refers to data such as stock exchange and futures market information that can change by the minute. Teachers can select from a variety of services linked by modem for use in the laboratory and classroom. The national FFA has contracted with Agridata to provide services tailored for FFA and for a variety of applications suitable for use by agricultural teachers. Prospects for using on-line databases in secondary agricultural education programs appear promising, but research data concerning implementation and use of Agridata is not available.

Large scale databases are accessed by microcomputer for retrieval, manipulation and use as computer assisted instruction (CAI). Previously, CAI has been limited to disk based software. Lower,et.al.,(1979) describes these programs as drill and practice, tutorial, simulation, problem solving and educational games. These strategies have the potential for application and use with large scale databases such as Agridata.

Most research on education with computers is on disk based software. These findings could apply to on-line CAI, although little research has be conducted to substantiate this assumption. Positive benefits from disk- based CAI software programs were found by Kulik, Bangert, and Williams (1983), and by Emmett (1983). Conversely, Russell (1983) found no significant differences on student test scores when taught with CAI. Experts have speculated that real time data, the availability of a wide variety of software programs, and other characteristics of on-line databases will make them more useful than disk based courseware.

Applications of the on-line database, Agridata, includes CAI, mailgrams, ordering FFA supplies, and communications with agriculture teachers, teacher education programs and state supervision. These uses could provide a valuable resource for the agricultural education profession; although some inhibiting factors could restrict use. The substantial cost for subscriptions, problems with communication software and hardware, and poor or inadequate phone systems have been noted by teachers as inhibitors to widespread use of Agridata.

Hence, research is needed to determine factors associated with the diffusion/adoption of on-line database systems in agricultural education. Rogers (1983) proposed a theoretical model for the study of the diffusion process for an innovation. Roger's model of the innovation-diffusion process includes the continuum of knowledge, persuasion, decision, implementation, and confirmation. Factors which could effect innovation-decision including prior conditions, and characteristics of the innovation (relative advantage, compatibility, complexity, trialability, and observability), are described by Rogers. This model provided a framework to study the stages associated with the diffusion process for implementing Agridata in agricultural education and to investigate the factors associated with each stage.

PURPOSES AND OBJECTIVES

The purpose of this research is to provide data to plan effective strategies for using on-line data bases in agricultural education programs. The research objectives are as follows:

1. Identify the prior conditions of previous practice, felt need, and norms of the social system associated with levels of the innovation-decision process.
2. Identify and describe the diffusion of the on-line data base, Agridata, in selected secondary agricultural programs along the innovation-decision continuum of; (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation.
3. Describe teacher perceptions about the characteristics of the innovation (Agridata) including: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (c) observability.
4. Determine movement along Roger's continuum of innovation-decision with the three levels of intervention; (a) no intervention, (b) assistance from the research staff through phone consultation, and (c) on-site assistance as requested by the agriculture teacher and provision of lesson plans which incorporate Agridata.

PROCEDURES

A case study approach was used in this study. The data source was teachers of vocational agriculture in six test schools. A list of fifteen school sites were selected by the teacher education staff and state supervisor staff. Criteria for selection was on the basis of geographical representation in the state, the teachers' use of computers in their program, and potential of the teacher to implement Agridata. A preliminary survey was mailed to teachers in these centers to identify school characteristics, agricultural education program characteristics, characteristics of the teachers and teacher interest in the project. Data from this survey provided the basis for ranking the schools for participating in the project.

A grant for on-line time and subscription costs was secured from Agridata and the National FFA to establish the six pilot centers. Six schools were selected to participate in the project. A follow-up letter was mailed to the teachers and their administrator with an explanation of the project and the responsibilities of the school system, the agriculture teachers, and the research staff. Agreement forms were signed in August of 1985 which marked the beginning of the project. Data in this phase of the project were collected through June 1, 1986.

Microcomputer use prior to the beginning of the project was determined by a questionnaire which indicated no experience using on-line databases by any of the programs. All teachers had experience using a microcomputer and were either in process, or were given permission, by their school administrator to purchase the equipment needed to use Agridata. Specific steps in the research are described.

Level one data collection

From August through the end of January the same conditions were maintained as would be found in any other high school agricultural education program in which Agridata was being implemented. Hence, the teachers were not assisted in any special way, but were allowed to experiment and use the system as they desired. Three test schools had student teachers during this time period under normal placement procedures, while the other three were not used as placement centers. Student teachers placed in these schools had received an introduction to the use of Agridata during on-campus sessions, were encouraged to experiment with it during student teaching, and to assist their supervising teacher with using Agridata if requested. No requirements or pressure were exerted on the student teachers to use Agridata. One placement center was unable to implement Agridata due to limitations in the telephone service available to the school.

Level two data collection

During February through March teachers were contacted by phone to determine their progress and if they needed technical or pedagogical related assistance from the research project staff. An interview schedule was used and data recorded on the basis of the phone interview. Two teachers requested assistance. Consultation was given by phone. During this time period, lesson topics were identified and three different styles of plans were developed by the project staff for use in determining their effect on integrating the use of Agridata into the curriculum. The topics were taken from a new state curriculum to eliminate variations in the teacher's past experience in teaching a particular unit.

Level three data collection

In late April 1986, teachers were mailed a questionnaire to determine their use of Agridata to date. This provided part of the data to describe the extent of diffusion/implementation when supported by phone from university level staff in addition to the phone support offered by Agridata. During the first week of May 1986, taped teacher interviews were conducted during the State FFA Convention to clarify and expand on data collected via questionnaire. These procedures provided quantatative and qualitative data.

Lesson plans for use with Agridata and a suggested timetable for using the plans were mailed to the teachers three weeks in advance of the convention. On-site consultation was offered on a teacher request basis. Two of the six teachers requested assistance. An inservice program was conducted at the state convention to discuss the use of Agridata and use of the lesson plans.

Additional levels of data collection planned

The research project was initially designed for a two year period. Hence, additional data will be collected in June of this year on the effects of lesson plans and on-site assistance. In Fall of 1986 all teachers in the project will be visited for a day by the research staff. The staff will demonstrate and assist the teacher practice use of Agridata to teach the lesson plans provided through the research project. This will provide an orientation to an experimental component of the study designed for Fall of 1986. Effects of lesson plans which incorporate Agridata will be compared with two other lesson plan formats. Other factors including teacher and student personality type; anxiety traits; and student computer aptitude, literacy and interest will be investigated. These data are not reported in this paper.

DATA ANALYSIS

Descriptive statistics, summarization of field notes, and summarization of taped interviews were used for analysis of quantatative and qualitative data collected in this study. The data collection procedures in this study provide for comprehensive and indepth analysis over a nine month period which is not possible with data from a mailed questionnaires. Analytical procedures suitable for a case study approach were used. A panel of experts was used to establish content validity and reliability on the appropriate data collection instruments.

RESULTS

Prior conditions

1. Teachers had no previous practice using Agridata and could only relate to the name prior to participating in this study. They did not have specific knowledge about features of Agridata.
2. Teachers expressed a high level of interest and a moderate need for using Agridata when the program was personally explained to them.
3. Norms of the social system were common among the six schools and included the following:

    a. an expectation for use of computers and associated technologies by parents, students and administrators;
    b. shared decentralized decision making processes about curriculum between teachers, administrators and significant others;
    c. a school context supportive of computer use with computers being used in several subject areas;
    d. limited formalization of computer use in the school and in the agriculture curriculum;
    e. limited funding for computer equipment and materials for use of computers in agriculture and in the school curriculum (Described by Roger's as organizational slackness);

f. problems which administrators and teachers attributed to low enrollment rural school districts such as funding, shortages of computers and peripherals, and lack of teacher support for learning new technologies in the school;
g. openness to use and for assistance in using new technologies by the agriculture teachers and their administrators

Innovation-decision continuum

The innovation-decision continuum according to Roger's (1983) contains five elements knowledge, persuasion, decision, implementation, and confirmation. Characteristics associated with these levels and common among all programs are described.

"Knowledge" occurs when an individual is exposed to an innovation's existence and gains some understanding of how it functions. The busy schedule of an agriculture teacher, anxiety associated with learning new technologies, and a perceived high demand of time needed to learn the system inhibited development of knowledge beyond an introductory level when left unassisted. Teachers developed an increasingly higher level of knowledge about using the system phone consultation, an inservice program and on site assistance. Teachers expressed the opinion that a structured educational program on uses of Agridata greatly improved their knowledge of the system and helped them move to the next level on the continuum, persuasion.

"Persuasion" occurs when an individual forms a favorable or unfavorable attitude toward an innovation. The six teachers in this study had formed a favorable attitude about Agridata from the onset of the experiment through the phone conversation with the research staff.

"Decision" occurs when an individual engages in activities that lead to a choice to adopt or reject the innovation. Other teachers of agriculture, university staff, and local administrators had the most influence on the teacher's decision to use Agridata. Limited movement along the innovation continuum to the decision levels occurred prior to on-site visitation by the research project staff and/or the placement of student teachers in the schools. Considering eight major services provided by Agridata, the decision stage was reached in only two categories by three or more teachers (lesson plans and communication area) prior to on-site assistance. Two categories, price and agricultural statistics were not used by any teachers.

The "implementation" stage is when an individual puts an innovation into use. Two teachers who reached the implementation prior to on site visitation by project staff indicated the presence of student teachers as most instrumental in achieving their level of success. The student teachers provided direct assistance and/or provided them the time needed to learn the system.

"Confirmation" is when an individual seeks reinforcement about his or her decision to implement the technology and may decide to reverse the former decision if conflicting evidence is found. As of the June 1, none of the teachers had decided to reverse their positive opinion of Agridata. However, Two of the five had not yet decided to continue with Agridata if their grant was not continued. The reason cited was lack of sufficient funding to maintain their "traditional" essential materials and supplies; and the lack of additional funding within the school system.

Characteristics of Agridata

Considering the five test centers which were able to continue through June 1986, the following characteristics of Agridata were noted:

a. Agridata was an "advantage" over other teaching strategies and could be successfully used in teaching vocational agriculture. Use of on-line databases enhances a "high tech" image for vocational agriculture.
b. The "anticipated complexity" of Agridata was a deterrent to use, but use was attainable. The complexity and technical problems with modem and communication software use was a major inhibitor which a majority of the teachers did not overcome without outside assistance.
c. Agridata was described as very "compatible" with the curriculum needs of the teachers.
d. The results of Agridata use were "highly observable" and respected by teachers. Teachers thought that use would be significantly increased if all teachers in the state were on the system. Many ideas for use were expressed by teachers if time were available for them to prepare for these activities.
e. The grant of one year provided the "trialability" period needed for teachers to experiment with the system. Test center teachers thought that they would not have tried Agridata during this year without the grant. It would not have been possible within their present budget without sacrificing other needed materials and supplies under the present funding system.

Levels of intervention affects

Teachers made limited progress on the use of Agridata until some type of on-site assistance (student teachers or research project staff) was provided. Teachers were positively affected by provisions of lesson plans which incorporated the use of Agridata. Interviews determined that problems with modems, communications software, and the phone system were major obstacles that had to be overcome through outside assistance before any pedagogical assistance could be addressed.

CONCLUSIONS AND RECOMMENDATIONS

1. The prior conditions in the test centers provided moral support and encouragement to facilitate the diffusion process for Agridata. This is a positive indicator for further diffusion of this technology within the profession. Limitations of computer hardware and communications equipment was the major inhibiting factor. Research on a wider population of schools is needed to substantiate this claim.

2. Teacher inservice in technical and pedagogical areas is needed to optomize the diffusion of on-line databases for instruction. Since the

test sites were with experienced teachers above average in knowledge and interest on computing, an even greater need for inservice for below average and average teachers may be present.

3. State level standardization/recommendations for modems and communications software and the development of instructional materials could positively affect implementation of Agridata .

4. Lower costs of on-line communication service, reallocation of funding in the agricultural department, or new sources of funding are needed to use Agridata. Cost reductions alone, however; may not lead to sustained use of the system. Teachers need inservice on Agridata, time to prepare for using the system, and/or given access to teaching materials which use Agridata.

   It is recommended that teacher educators, state education staff, and Agridata assume a greater responsibility in these areas than presently exists in the State. Other states may wish to examine their level of commitment in this area.

5. Agridata has potential for instructional use in vo-ag. It was found to be compatible with the agricultural education curriculum, is not overly complex, and produces observable differences in the classroom.

6. Additional research is needed to study the effect of Agridata on student learning, the types of curriculum materials needed to use with Agridata, and the variables that are related to effective use of the system by teachers, after hardware and software problems are overcome.

7. Interviews and on-site observation greatly enhanced the collection of meaningful data that provided answers to "telling questions." Mail questionnaires and larger sampling techniques would have provided the opportunity for the depth of inquiry attained in this study.

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Factors Affecting The Diffusion/Use Of An On-Line Database System (Agridata) For Instruction In Vocational Agriculture Programs In New York State: Phase I -- A Case Study

A Critique

Richard M. Foster, University of Nebraska-- Discussant

The purpose of this research was to use a case study approach to plan and evaluate an effective strategy to utilize a computerized on-line data base in vocational agriculture programs.

Strengths Of The Study

Perhaps the greatest strength of the study lies in the use of Rogers theoretical model for the study of the adoption and diffusion of a new innovation. The researchers used the model as a framework to study the implementation of the agridata on-line data base in vocational agriculture programs. The case study research technique, though seldom used in agricultural education, requires more careful planning and observation than most other types of research. Readers of case study research must also realize that findings and conclusions have to be interpreted based on the knowledge that information may be gathered subjectively.

The authors are to be commended for their attention to detail in establishing criteria for test site school selection. Careful field observation during the three levels of intervention were criticle as well. It appears that validity of the data collection instruments and collection processes was well planned.

The authors do a good job of explaining the diffusion of agridata in terms of the five elements of Rogers model. Information gathered and reported in the conclusion section is highly transferible and applicable for use in diffusion of similar technology in similar situations in the future.

Areas In Need Of Strengthening

Because the study was designed for a two year duration, only observations for the first year (Phase I) were provided. It may have been more appropriate to refrain from reporting of the data until the entire study was completed. However, the adoption-diffusion portion is well documented.

Additional information on methods used to gather information from the six test sites and methods of training observers and/or field data collectors would enhance our confidence in the case study method of research presented. A futher explanation of "analytical procedures suitable for a case study" would also be appropriate.

FACTORS ASSOCIATED WITH ADJUSTING VOCATIONAL AGRICULTURE PROGRAMS AS PERCEIVED BY TEACHERS

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INTRODUCTION

Important changes have occurred in the agricultural industry in recent years (Heffernan and Campbell, 1984). The trend toward fewer commercial farms and farmers, accompanied by an increase in the size of commercial farm units, are changes which many familiar with agriculture have come to accept as inevitable (Rural Missouri 1995: Challenges and Issues, 1985). Programs of vocational agriculture must be adapted to meet the needs of a changing agriculture (Bowen, 1986). Vocational agriculture programs were initially developed to provide instruction in agriculture to assist students who intended to enter production agriculture occupations (Smith-Hughes Act, 1917). Subsequent legislation (Vocational Education Act, 1963) expanded the focus of such programs to provide instruction for students who anticipated employment in off-farm agricultural occupations as well. As a result, many vocational agriculture programs have begun to expand course offerings and curricula to prepare students for a variety of careers related to agriculture. However, recent changes in production agriculture and related services have provided the impetus to study further changes needed in local programs.

PURPOSE AND OBJECTIVES

The purpose of this research was to assess perceptions of Missouri vocational agriculture teachers regarding factors related to selected curricula adjustments in local programs. Five general areas of program emphasis were identified as the central focus of this study: production agriculture, agribusiness, agricultural mechanics, horticulture, and forestry. These five areas were selected as the most practically significant curriculum areas to be included in this study. The five areas examined were considered to be potential areas for program expansion on a broad scale throughout the State of Missouri. Specific objectives developed to guide and direct this study were to assess vocational agriculture teacher perceptions of:

1. the adequacy of vocational agriculture programs in preparing students for careers in five areas.
2. which areas of the total curriculum should receive greater emphasis and how such modifications would impact student enrollment.
3. the adequacy of local SOEP opportunities in five curriculum areas.
4. which curriculum areas would require a major program revision if incorporated in local programs.
5. the adequacy of teacher preparation and the need for future inservice in five curriculum areas.

PROCEDURES

Data collection was completed at the conclusion of each of 13 area inservice workshops held throughout the State of Missouri in October, 1985. The population consisted of 201 vocational agriculture teachers who were identified by virtue of their attendance at an inservice workshop session. The workshop sessions were entitled "Program Enhancement--Integrating Instruction in Production, Agribusiness, Mechanics, Horticulture, and Forestry." The purpose of the workshops was to discuss practical modifications which may have been appropriate for local vocational agriculture programs. The entire population of workshop attendees provided responses which represented approximately 62 percent of all secondary vocational agriculture teachers in the State of Missouri.

The data collection instrument was developed by faculty members in Agricultural Education at the University of Missouri-Columbia. A field test of the instrument was conducted utilizing members of the Missouri Joint State Staff in Agricultural Education which consisted of former vocational agriculture teachers (i.e. teacher educators and state supervisors). Modifications of the instrument were made following the field test to improve clarity and readability.

ANALYSIS OF DATA

The data collection instrument allowed respondents to indicate their level of agreement or disagreement with seven stem statements for each of five selected areas of the curriculum. A five-point Likert-type scale was used to insure uniformity among respondents and to facilitate comparisons among curriculum areas for each statement.

Responses were numerically coded so that a response of "strongly agree" received a value of "1", a "neutral" response received a "3", and "strongly disagree" received a "5". Response means were computed for each of the 35 items and were the focus of subsequent data analysis.

The response scale was divided into three equal segments to facilitate interpretation of the results. Means of less than 2.33 were assumed to indicate relative agreement with the underlying statement. Means between 2.33 and 3.67 were categorized as collectively neutral in the middle response category. Means of 3.67 or greater were assumed to indicate relative disagreement with the associated statement.

Examination of means computed from a bi-polar scale may be misleading without considering the variability of responses. Therefore, standard deviations were important statistics to consider to assess the variability of responses for each item. Relatively large standard deviations would appear to indicate greater disparity among responses whereas smaller standard deviations would be indicative of relatively uniform responses.

Instrument reliability was computed as part of the data collection process. A coefficient alpha = .92 was computed using the SPSS subprogram RELIABILITY (Hull and Nie, 1981).

Conclusions and recommendations resulting from this research effort were limited to vocational agriculture programs supervised by teachers providing responses. However, some recommendations may have practical implications for other vocational agriculture programs in Missouri as well as other states.

RESULTS

Each of the 201 vocational agriculture teachers in attendance at an area inservice workshop provided responses and contributed to the 100 percent response rate for the population surveyed. Teacher respondents reported an average program enrollment of 61.2 students and 10.0 years of teaching experience. Response ranges for these two characteristics varied from 22 to 203 enrollees and from one to 36 years of teaching experience, respectively.

Data in Table 1 presents response means and standard deviations for each curriculum area assessed and for each of the seven statements included in the instrument. Relatively low means and standard deviations for both production agriculture and agricultural mechanics revealed that teachers tended to agree that their programs were adequately preparing students for careers in those areas. Teachers perceived their programs to be less-than-adequate in preparing students for careers in horticulture and forestry as indicated by item means in excess of the 3.66 level. Teacher responses were computed in the middle category concerning the adequacy of their vocational agriculture programs in preparing students for careers in agribusiness.

Teacher respondents indicated their agreement with the need to place greater emphasis on agribusiness in their local curriculum. However, the remaining four curriculum areas produced means in the middle category. There was also greater uniformity in teacher response to the need to expand the emphasis on agribusiness as indicated by the lower standard deviation associated with that mean.

Expanding the emphasis in certain curriculum areas may also have enabled local vocational agriculture programs to serve a greater number of students. Teacher respondents tended to agree that expanding programs in the areas of agribusiness, horticulture, and agricultural mechanics may result in increased student enrollments. Respondents tended to neither agree or disagree with the statement regarding the influence on student enrollment as a result of expanding production agriculture and forestry curriculum areas at the local level.

The opportunity for supervised occupational experience programs (SOEP) was also assessed relative to each of the curriculum areas studied. Teachers tended to agree that adequate opportunities existed in local communities for students to conduct SOEP's in the areas of production agriculture, agribusiness, and agricultural mechanics. However, response means in the middle category were produced in regard to the adequacy of SOEP opportunities in horticulture and forestry.

Teacher respondents agreed that major program revisions were necessary to incorporate instruction in horticulture and forestry. Teachers tended to disagree that incorporating production agriculture would require a similar revision. However, they were "collectively neutral" in their perception of the need for major program revisions to incorporate instruction in agribusiness and agricultural mechanics.

There was rather uniform agreement among teacher respondents regarding the adequacy of their preparation to teach production agriculture, agricultural mechanics, and agribusiness as indicated by the relatively low means and standard deviations for each of those areas. However, teachers tended to vary widely in response to the adequacy of their preparation to teach both horticulture and forestry. There was also greater variability among responses concerning the adequacy of teacher preparation in horticulture and forestry than for the other curriculum areas.

There appeared to be relatively uniform agreement among respondents regarding the need for inservice education in the area of agribusiness as this curriculum area produced the lowest mean and standard deviation. Teacher respondents also indicated, to a lesser degree, the need for inservice in horticulture, forestry, and agricultural mechanics. A response mean in the middle category was computed for the need for inservice education in production agriculture.

CONCLUSIONS AND/OR RECOMMENDATIONS

Data provided by workshop participants were analyzed to ascertain the perceptions of selected Missouri vocational agriculture teachers regarding the effect of program modifications in five curriculum areas. Although conclusions and resulting recommendations were limited to teachers who participated in workshop activities, results of this study may have practical implications for other vocational agriculture programs and teachers in Missouri as well as other states.

Respondents indicated vocational agriculture programs were adequately preparing students for careers in production agriculture and agricultural mechanics. Also, teachers reported local programs were less adequate in preparing students for careers in agribusiness. Furthermore, respondents revealed that local vocational agriculture programs have generally not yet expanded into horticulture and forestry curriculum areas. Relatively high standard deviations indicated wide variations in response to the horticulture and forestry areas also existed.

These findings appear to support the conclusion that vocational agriculture programs in Missouri were somewhat traditional in nature and have not deviated significantly from the production and mechanics orientation which characterized early programs. The inability of such programs to prepare students for careers in horticulture and forestry should not be viewed as an indictment for poor quality instruction. Vocational agriculture teachers may have conscientiously refrained from providing instruction in those areas in view of local student and community needs.

Teacher respondents were asked to indicate the perceived need for additional programmatic emphasis in each of the five curriculum areas. Agribusiness was the curriculum area which teachers most uniformly agreed needed additional emphasis in local programs. Therefore, it would appear that modifying local vocational agriculture programs to incorporate agribusiness instruction should receive relatively high priority status among agricultural educators.

Production agriculture, agricultural mechanics, horticulture, and forestry produced response means near the midpoint of the scale in regard to the need for additional emphasis in local programs. Responses for production agriculture and agricultural mechanics were possibly due to the adequacy of student preparation for careers in those areas. However, teacher respondents indicated that most vocational agriculture programs were not preparing students for careers in horticulture and forestry.

Declining student enrollments has been a topic of major concern among many vocational agriculture teachers and administrators. Therefore, it was important to ascertain the anticipated effect on student enrollment as a result of expanding vocational agriculture programs in the five curriculum areas identified. Expanding agribusiness, horticulture, and agricultural mechanics were viewed as having a positive impact on student enrollment. Similar influences on student enrollment were not anticipated as a result of expanding instruction in the areas of production agriculture and forestry. Teacher respondents reported that adequate opportunities existed for student SOEP's in production agriculture, agribusiness, and agricultural mechanics in local communities. However, teachers reported SOEP opportunities were more limited in horticulture and forestry.

Teachers anticipated major program revisions were necessary to accommodate incorporation of horticulture and forestry instruction in local vocational agriculture programs. However, teacher respondents indicated that major revisions would not be necessary to increase the emphasis on production agriculture, agricultural mechanics, or agribusiness in the local program.

The perceived adequacy of teacher preparation in the five curriculum areas was examined as part of this study. Teachers reported adequate preparation for teaching production agriculture, agricultural mechanics, and agribusiness. Teachers also indicated they felt less adequately prepared to teach horticulture and forestry although responses varied widely.

Teachers reported the greatest need for inservice assistance in the agribusiness area as evidenced by the lowest mean and standard deviation. Horticulture, forestry, and agricultural mechanics were also found to be potential topics for future inservice workshops. Production agriculture inservice programs were the least important of the five areas examined.

As a result of this study, it appeared that modifying vocational agriculture programs to incorporate instruction in agribusiness was warranted. Teachers indicated that increased emphasis on agribusiness was needed, would allow more students to be served, and would not require a major revision in the existing program. Also, teachers perceived themselves as being relatively prepared to teach agribusiness and that there were sufficient opportunities for SOEP in local communities.

Although increased emphasis on agribusiness may produce positive results, such a modification should not be viewed as a panacea for the problems facing vocational agriculture. Program expansion in other areas may also be worthy of investigation in localized regions. Emphasis on agricultural mechanics and horticulture may be increased in certain areas as local conditions dictate. Forestry may likewise be important subject matter to incorporate in local programs; however, geographic characteristics will influence the location of such programs. District supervisors may be in a position to encourage program modifications on a regional rather than statewide basis.

Future inservice efforts should concentrate on agribusiness and how that curriculum area may be incorporated into local vocational agriculture programs. Supplemental inservice assistance was also needed in horticulture, agricultural mechanics, and forestry. Production agriculture appeared to be the lowest priority area for inservice relative to the other curriculum areas examined.

Agricultural educators should monitor the environment in which vocational agriculture programs operate. Changes in agriculture and education will directly influence the type and scope of future programs. Teachers, supervisors, and teacher educators should examine the need to modify vocational agriculture programs to address anticipated changes. The future of vocational agriculture is dependent upon the ability of agricultural educators to modify programs to function in the changing agricultural environment.

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Table 1. Means and standard deviations of teacher perceptions of factors associated with expanding five areas of the vocational agriculture curriculum.

Statement	N	Area of curriculum				
		Production agriculture	Agribusiness	Agricultural mechanics	Horticulture	Forestry
		$\bar{X}$ s.d.	$\bar{X}$ s.d.	$\bar{X}$ s.d.	$\bar{X}$ s.d.	$\bar{X}$ s.d.
1. My current vocational agriculture program adequately prepares students in _____	201	1.37[1] 0.64	2.35 1.01	1.52 0.83	3.70 1.45	3.76 1.39
2. Greater emphasis should be placed on _____ in my local program.	201	2.66 1.38	1.67 0.85	2.33 1.13	2.36 1.26	2.72 1.36
3. Expanding my local program in _____ would allow more students to be served.	201	2.76 1.35	1.88 1.04	2.32 1.17	2.08 1.22	2.43 1.40
4. There are adequate opportunities in my local community for SOEP in _____	201	1.64 1.01	2.14 1.13	2.20 1.08	2.91 1.38	3.09 1.50
5. Incorporating _____ in my program would require a major program revision.	201	3.74 1.63	3.03 1.51	3.46 1.57	1.91 1.23	2.03 1.31
6. I feel adequately prepared to teach _____	201	1.13 0.45	1.81 0.88	1.49 0.78	3.25 1.44	3.34 1.46
7. Future inservice programs should include instruction about _____	201	2.68 1.33	1.78 0.95	2.32 1.16	2.02 1.20	2.26 1.37

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[1] Strongly Agree = 1, Neutral = 3, Strongly Disagree = 5.

Factors Associated with Adjusting Vocational Agriculture Programs as Perceived by Teachers
A Critique

Gilbert A. Long, Utah State University ---------------Discussant

The Birkenholz, Stewart, study represents a study of needed change as perceived by vocational agriculture teachers. The strengths of this study lie in the thoroughness with which the objectives describe program components that need to be evaluated in deciding whether to change the program emphasis. The teachers were asked questions that called upon them to evaluate the adequacy with which their present program emphasis prepared students for careers presently available in agriculture, what program modification would do to student enrollment, the adequacy of local SOEP opportunities in five curriculum areas, the adequacy of teacher preparation in these five areas of curriculum, and which curriculum areas would require a major program revision if incorporated in local programs.

The results of the study are clearly presented and the results of the data analysis are accurately and clearly reported and discussed. The study does an excellent job of assessing consensus for change. I would surmise that the Missouri Vocational Agriculture teachers surveyed are ready for inservice instruction in agribusiness in a greater degree than would have been the case had they not been asked for this self evaluation of their program needs and perceptions of how much revision they would need to make such changes. Within the constraints of research that seeks to solve problems, this is good research.

Teacher respondents agreed that they needed to place greater emphasis on agribusiness in their local curriculum, that expanding programs in agribusiness, horticulture, and agricultural mechanics might result in increasing enrollments, and that they would have difficulty finding work stations for SOEP in horticulture and forestry.

The methodology might have been improved to include participants from the group who did not attend inservice workshops in addition to the workshop target group. This would have improved the design of the study as well as provide some evidence regarding measureable differences between those who volunteer for professional growth activities versus those who do not. Generalization to all Missouri Vocational Agriculture teachers could have been more readily done had such a sample been taken. Descriptive information about the instructional programs, teacher characteristics, and school characteristics, if provided, would have enabled our application to our own states.

In summary, the authors are to be congratulated for conducting practical research that will probably impact programs. While systematically studying teachers' perceptions of change, the authors did a good job of leading teachers through a logical analysis of the teacher's own program of instruction. The research reported provides a good model for such efforts to be conducted usefully in other states.

FACTORS RELATED TO THE CAREER DECISIONS OF SENIORS WHO HAVE TAKEN VOCATIONAL AGRICULTURE

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INTRODUCTION

One observation can be made about teachers of vocational agriculture when career guidance is discussed: career guidance has always been considered a part of their job. They have often been doing more guidance than they have been aware of and several studies during the 1960's and 1970's,such as Eaddy 1968), indicated that the vocational agriculture teacher has often been more effective than the school counselor in the area of career guidance.

However, a search of the literature revealed that relatively little attention has been paid to career development in vocational agriculture in recent years. In an Ohio study in 1984, McCracken, Barrick and Beard studied the relationship of farm background to the educational and occupational plans of vocational agriculture students. They found that "there were no differences by sex in their occupational goals, reasons for their decisions to enroll, or their plans following graduation" (p. 56). One implication from their study indicated that "Because the majority (57.3%) of the students plan additional education beyond secondary school, the high school curriculum should serve to prepare students for further education as well as to immediately enter an occupation" (p. 56).

In a study by Arrington (1985), it was found that 73.4% of Florida's senior vocational agriculture students perceived (either agreed or strongly agreed) that their experiences in vocational agriculture helped them to choose an occupation. When asked about their vocational agriculture teacher's assistance in career selection, 88.4% agreed that their vocational agriculture teacher encouraged them to enter an occupation in agriculture, 77/3% agreed that their teacher encouraged them to consider attending college, 73.7% agreed that their teacher provided information on careers outside of agriculture, and 96.8% agreed that their teacher provided information on agricultural careers.

Findlay and Rawls (1984) studied the factors that influenced the agricultural career objectives of students attending historically black four-year institutions. They found that the students indicated that their immediate family influenced them most in pursuing their agricultural career objectives on all but one of the 24 guidance services studied.

Eaddy (1968) conducted a study that was very similar to the study reported here. He found that the persons who influenced the vocational choices of vocational agriculture students were ranked as follows: parents, friends, relatives other than parents, school personnel, and clergymen. He also found that student occupational choices were based primarily upon personal interests, satisfaction and rewards and that high school academic achievement records were related to student vocational choice levels.

The study reported in this paper was designed to determine the individuals who influence vocational agriculture students' career decisions and the factors that these students take into consideration in making career decisions. What parents, teachers and guidance counselors encouraged students to do after high school was explored. In addition, the differences in responses between vocational agriculture, other vocational, and non-vocational students were addressed. This information should be of value in planning the vocational agriculture curriculum and in career related areas of the instructional program.

PURPOSE AND OBJECTIVES

The purpose of this study was to determine the individuals and factors that have influenced the career decisions of vocational agriculture students and to determine if vocational agriculture students' responses differ from those of other vocational and non-vocational students. The objectives were:

1. Determine which persons have influenced the career decisions of Louisiana high school seniors who have taken at least one semester of vocational agriculture.
2. Determine the factors that have influenced the career decisions of Louisiana high school seniors who have taken at least one semester of vocational agriculture.
3. Determine what parents, teachers and guidance counselors have encouraged Louisiana high school seniors who have taken at least one semester of vocational agriculture to do after leaving high school.
4. Determine if the responses regarding the persons and factors that have influenced the career decisions of Louisiana high school seniors who have taken at least one semester of vocational agriculture are distributed independently of other senior vocational and non-vocational students. (Non-vocational students are those students who reported that they had never taken a vocational course.)
5. Determine if a relationship exists between years in vocational agriculture and whether the vocational agriculture program or the vocational agriculture teacher had an effect on the student' career decisions.

PROCEDURES

A closed-form questionnaire designed to secure the information needed for this study was developed by the project staff based on a review of the literature. The instrument was field tested with 1205 students in three high schools of varied size, course offerings, geographic location and socioeconomic status. The field test revealed that the instrument was a valid and reliable instrument and that only minor revisions were necessary. Reliability estimates were calculated using Cronbach's Alpha. The estimates for the three scales in the instrument were $\underline{r} = .95$, .97, and .98.

The population consisted of all senior students in Louisiana's public high schools. The sample consisted of all senior students in 43 Louisiana high schools. The sampling procedure used was a cluster sample within a stratified (by 5 school sizes and 3 culturally diverse geographic areas) random sample with replacement (Snedecor & Cochran, 1980). The frame for the study was taken from the Louisiana School Directory 1985-1986 (1985) which is the official listing of educational institutions in Louisiana. The purpose for using this design was so that identified subgroups (by school size and area of state) within the population would be represented in the sample in the same proportion that they existed in the population. This plan allowed fairly accurate estimates of each stratum and much more accurate estimates of the overall population. The largest sampling error anticipated in any cell was 10.7%, with the error rates by strata being much lower. A total of 3,813 students who were in attendance on the day of data collection were surveyed from an estimated population of 45,000.

All data were collected on-site by a project staff member during April, 1986. Packets with pencils, instruments, answer sheets, and instructions for each group monitor or homeroom teacher were distributed by the project staff. The instrument was administered during the homeroom period or during a morning activity period. The instrument took approximately 20-25 minutes to complete.

DATA ANALYSIS

Descriptive statistics were used to describe the data relative to objectives 1, 2, and 3. The chi-square test of independence was used to determine if the responses to selected questions were distributed independently of whether the student had taken vocational agriculture, had taken other vocational courses, or had not taken vocational courses (objective 4). The Spearman rho correlation coefficient was used to determine if a relationship existed between years in vocational agriculture and whether the vocational agriculture program or the vocational agriculture teacher had an effect on the student' career decisions (objective 5). An alpha level of .01 was used.

RESULTS

Of the 3,858 students involved in this study, 830 had taken vocational agriculture, 2,776 had taken some other vocational course or courses, and 252 had never taken a vocational course in high school.

Factors Important in Selecting a Career

The students were asked to indicate if selected factors were important to them in selecting a career by marking either "yes" or "no." The factors and the percentage of students who responded "yes" to each factor are presented in Table 1. As the data indicate, the factors that received the most "yes" responses from students who had taken vocational agriculture were interest in this work, working conditions, salary or wages, and personal satisfaction.

The chi-square test of independence was used to determine if the responses were distributed independently of whether the student had taken vocational agriculture, whether the student had taken other vocational courses, or whether the student was a non-vocational student. Eleven of the analyses resulted in significant chi-square values. The results are presented in Table 1.

Students who had taken vocational agriculture or other vocational courses responded "yes" more often to indicate that the factor was important to them in selecting a career for nine of the eleven factors for which their were significant chi-square values. The two exceptions were personal satisfaction and inheritance of a farm or business.

For the factor personal satisfaction, 84.7% of vocational agriculture and non-vocational students responded "yes" compared to 88.4% for other vocational students. For the factor inheritance of a farm or business, 32.4% of

Table 1.

Factors Affecting the Career Decisions of High School Seniors (*n* = 3,858)

	Percent Responding Yes			
Factor	Vo-Ag	Voc.	Non-Voc.	Chi-square
Interest in this work	90.1	93.4	85.9	23.94***
Working conditions	84.5	90.0	80.2	33.64***
Salary or wages	84.8	87.5	82.3	7.92
Personal satisfaction	84.7	88.4	84.7	9.42***
Availability of jobs	78.8	81.2	72.8	11.45*
Work experience	74.7	72.4	62.2	14.89**
Status and reputation of occupation	71.8	75.8	66.7	13.54*
Indoor or outdoor work	66.3	58.2	52.4	22.86***
Fringe benefits	66.3	69.3	64.8	4.19
Length of time for training	64.6	61.3	57.4	5.06
Cost required to prepare for this career	64.5	63.7	57.8	3.83
Special talents or abilities	63.4	68.2	66.5	6.60
Financial backing is available	62.2	62.3	55.2	4.85
Contributions to society	54.3	59.0	52.2	8.78
Geographical location	48.8	45.6	41.4	4.83
Friends, parents or relatives working in the occupation	47.6	35.9	33.1	39.47***
Insistence of parents or relatives	45.1	34.3	28.6	38.35***
Marriage	41.1	41.6	36.0	2.89
Inheritance of a farm or business	32.4	18.8	20.1	68.45***
Family tradition	32.8	21.7	20.6	44.07***

$^{*}p<.01$, $^{**}p<.001$, $^{***}p<.0001$

vocational agriculture students, 18.8% of other vocational students, and 20.1% of non-vocational students responded "yes."

The largest difference among the range of distributions existed for the factor, insistence of parents or relatives. The data reveal that 45.1% of vocational agriculture students responded "yes" while only 35.9% of other vocational students and 33.1% of non-vocational students responded "yes."

Persons Affecting Career Decisions

The students were asked to indicate if selected persons influenced their career decisions by marking either "yes" or "no." The persons and the percentage of students who responded "yes" about each person are presented in Table 2. The data indicate that the persons who received the most "yes" responses were the students' mother, father, friend and person in the occupation.

The chi-square test of independence was used to determine if the responses were distributed independently of whether the student had taken vocational agriculture, whether the student had taken other vocational courses, or whether the student was a non-vocational student. Twelve of the analyses resulted in significant chi-square values. The results are presented in Table 2.

Students who had taken vocational agriculture or other vocational courses responded "yes" more often to indicate that the person affected their career decisions for nine of the twelve persons listed for which their were significant chi-square values. The three exceptions were for military recruiter, coach, and clergy (pastor, priest, rabbi, or other clergy). For these three persons, the non-vocational students responded "yes" more often than did the other vocational students with much higher numbers of vocational agriculture students responding "yes" than for the other two groups.

As expected, the largest difference among the range of distributions existed for one individual, the vocational agriculture teacher. The data revealed that 29.3% of vocational agriculture students felt that the vocational agriculture teacher influenced their career decisions while only 5.6% of other vocational students and 5.0% of non-vocational students indicated that the vocational agriculture teacher had an effect. The next highest differences in the ranges occurred for relatives (grandparent, aunt, uncle or other relative), military recruiter, and father.

Other Results

When asked what selected individuals had encouraged them to do after high school, 66% indicated parents, 81% indicated teachers, and 78% indicated counselors encouraged them to go to college. The remaining responses were in the categories of attend vocational-technical school, work full time, or go to the military.

Students were asked about selected individuals' attitudes towards vocational courses. The responses showed that 88.7% indicated their parents, 81.4% indicated their counselors, and 86.7% indicated the student had a favorable attitude toward vocational education.

When asked who they discussed their course choices with, 79.2% indicated their parents, 58.2% indicated the guidance counselor, and 48.9% indicated their teachers. When asked who they discussed their career goals with, 84.3% indicated their parents, 47.7% indicated their teachers and 38.9% indicated their counselors.

Table 2.

Persons Affecting the Career Decisions of High School Seniors (n = 3,858)

	Percent Responding Yes			
Person[a]	Vo-Ag	Voc.	Non-Voc.	Chi-square
Mother	71.2	69.3	63.9	4.46
Father	66.1	57.3	55.8	20.85***
Friend	57.2	53.7	53.9	3.04
Person in the occupation	56.5	54.8	46.9	7.00
Grandparent, aunt, uncle or other relative	49.6	43.7	37.2	14.53**
Brother or sister	43.0	36.4	33.5	13.34*
Other teachers	36.0	37.2	38.6	0.62
Guidance counselor	29.9	29.1	22.8	4.75
Vocational agriculture teacher	29.3	5.6	5.0	375.34***
Military recruiter	28.3	16.5	19.9	55.40***
Business and office occupations teacher	22.1	27.1	12.9	28.49***
Coach	21.5	13.1	16.5	33.63***
Principal	19.7	11.0	13.1	40.79***
Industrial arts teacher	19.0	11.7	8.3	34.63***
Pastor, priest, rabbi or other clergy	17.4	11.2	12.3	21.58***
Home Economics Teacher	16.0	11.2	5.4	23.58***
Marketing and distributive education teacher	14.9	11.2	8.8	10.65**

Note. It should be noted that not all students had the opportunity to know the different vocational teachers and some schools did not have all programs. In addition, differences by sex and race are not reflected in this table.

$^{*}p<.01$, $^{**}p<001$, $^{***}p<.0001$

When asked which courses influenced their career decisions, more students indicated math (50.1%) and business (49.9%) than vocational agriculture (45.5%). Fewer numbers of students indicated that the other 13 courses listed had influenced their career decisions.

Spearman's rho was used to determine if a relationship existed between whether a student indicated that the vocational agriculture teacher had affected the students' career decisions and the number of years that the student had been enrolled in vocational agriculture. A significant value of rho = -.2669 ($\underline{p}$ < .001) was calculated indicating that a negative relationship existed. Fewer students indicated that the vocational agriculture teacher influenced their career decisions as the number of years in vocational agriculture increased.

Spearman's rho was also used to determine if a relationship existed between whether a student indicated that vocational agriculture had affected the students' career decisions and the number of years that the student had been enrolled in vocational agriculture. A significant value of rho = -.3838 ($\underline{p}$ < .001) was calculated indicating that a negative relationship existed. Fewer students indicated that vocational agriculture influenced their career decisions as the number of years in vocational agriculture increased.

CONCLUSIONS AND/OR RECOMMENDATIONS

1. For vocational agriculture students as well as other seniors, parents influence these students' career choices more than any other persons, with the mother being more influential than the father. State staff and teacher educators should encourage vocational agriculture teachers, counselors and other teachers to consider this factor when working with current students and when recruiting prospective students.
2. For vocational agriculture students, the vocational agriculture teacher is about as influential as the counselor with regard to career decisions. Teacher educators and state supervisors should make this fact known to vocational agriculture teachers and teacher educators should take this into consideration when planning recruitment programs. In addition, vocational agriculture teachers should recognize counselors as being equally influential with the vocational agriculture students and more so with all other students in the school. Strong support and cooperative efforts between the vocational agriculture teacher and the guidance counselor are warranted.
3. Too many parents, teachers and counselors are encouraging students to go to college. Over 65% of the students perceived that they were being encouraged to go to college by parents, teachers and/or counselors. Standardized test statistics, job availability for college graduates and other factors indicate that this percentage is very unrealistic. This information should be shared with principals, counselors and the news media in an attempt to alleviate this situation.
4. Interest in the work, working conditions, salary/wages, and personal satisfaction are the leading factors for seniors in selecting a career. The students' responses to these factors, as well as to the other leading factors, should be given strong consideration by vocational agriculture teachers in planning their curriculum.
5. The differences in responses between vocational agriculture students who had taken at least one semester of vocational agriculture and all other senior students indicate that a uniqueness exists in the career decision making patters of the vocational agriculture students. High school teachers, counselors and administrators should further examine how different students

make their career decisions and, if needed, modify the career guidance program accordingly.

6. A negative relationship existed between years in vocational agriculture and whether the vocational agriculture program or the vocational agriculture teacher had an effect on the student' career decisions. Since the vocational agriculture program is a vocational training program, additional research should be conducted to validate this finding and, if this finding is true, state supervisors and teacher educators should immediately undertake efforts to address this issue. validated, to determine the factors that contribute to this negative relationship.

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Factors Related To The Career Decisions of Seniors Who Have Taken Vocational Agriculture

A Critique

R. Lee Cole, Oregon State University -- Discussant

This was an interesting study because it sought to identify persons and factors that impact career decisions of graduating seniors. The study did a commendable job of drawing from a review of literature to introduce the problem. The study did find, at least on the surface, glaringly different results from similar studies reported in the literature review and introduction.

The introduction was well laid out. However, I would suggest that fewer long sentences be used to increase clarity. I would also suggest that more proper nouns be used and fewer pronouns. At times it was difficult to distinguish between "their" referring to students in a specific study and "their" referring to authors of a specific study.

The purpose, objectives and procedures were clearly identified with a brief discussion of instrument validity and reliability. When data analysis was considered, a test like Kruskal-Wallis might have been added. The Kruskal-Wallis would have determined which vocational agriculture teachers and/or which vocational agriculture programs were having the most and least effect on student career decisions given the non-parametric data you had available.

An interesting change in this study was the use of the yes-no scale versus a Likert type five point scale, and the use of the 0.01 Alpha level. Statisticians argue both sides of these issues. It would have been useful to have heard the reasons these authors used for selecting the scale and the Alpha level used in this study.

The conclusions and recommendations are reported in a concise, one through six format, which is commendable. I would prefer that the authors refer to specific objectives their your conclusion statements or order the conclusions the same as the objectives are ordered. This would help maintain clarity and assure complete coverage of the objectives.

My statistician informed me that your study was not designed to generate the kind of conclusion you have in point number six. Mathematically you would expect this kind of correlation because as students gain experience and maturity they have numerous other opportunities for input. With these additional inputs and experiences the impact of one particular event will be diluted, thus students should identify subsequent experiences as more important than baseline experiences. This phenomenon of recency of experience may have contributed to the negative correlations of concern in this study. Regardless of how the data is interpreted for conclusion number six the recommendation for further study is warranted to bring clarity to this issue.

To summarize, this was an extremely interesting and timely study. The study generated many other questions which were closely associated, or grew directly out of this study. I hope the authors continue to investigate the subject to refine and add to our understanding of this topic as a profession. Results of this study should be published for both access by teacher educators and vocational agriculture teachers

IMPACT OF BEGINNING TEACHING SUPERVISION ON VOCATIONAL AGRICULTURE TEACHER PERFORMANCE

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INTRODUCTION

Nationally there is a concern regarding the induction process, or lack thereof, for beginning teachers. State education departments, universities, and local school districts are beginning to make concerted efforts to help beginning teachers meet the challenges of successfully completing the first years of teaching. Policies are being formulated by educational agencies regarding the way beginning teachers are to be assisted and/or assessed; however, these policies vary from "precisely stated expectations for teaching behaviors to more broadly conceptualized ways that new teachers can be helped to become competent" (Griffin et. al., 1983, p.2).

PURPOSES AND OBJECTIVES

The national concern regarding the problems of beginning teachers provided the basis for conducting this study to assess the impact of the individual teacher supervision component of the beginning teacher program conducted by the Department of Agricultural and Extension Education at The Pennsylvania State University. Specifically, the study analyzed differences with regard to measures of job satisfaction and teaching clarity between a group of teachers who participated in the program and a similar group of teachers who did not participate in the program. Secondary or moderating variables also studied, in an attempt to explore their possible interactive effects with treatment level upon job satisfaction and teaching clarity, were years of teaching experience and the effects of school-sponsored induction programs.

Three multivariate hypotheses were formulated to analyze data related to the objectives. It should be noted that the testing of three separate hypotheses was necessary as opposed to a preferred single multivariate hypothesis test because of the small sample size. The hypotheses were as follows:

1. H_0: Participation in the beginning teacher supervision program and number of years of teaching experience are not related to post-treatment scores on the job satisfaction index and the teaching clarity index when controlling for the effects of pre-treatment scores on both indices.

2. H_0: Participation in the beginning teacher supervision program and the number of school-sponsored induction activities are not related to scores on the job satisfaction index and the teaching clarity index when controlling for the effects of pre-treatment scores on both indices.

3. H_0: Participation in the beginning teacher supervision program and teachers' perceptions regarding the effectiveness of school induction activities are not related to scores on the job satisfaction index or teaching clarity index when controlling for the effects of the pre-treatment scores on both indices.

PROCEDURES

Design

A variation of the Nonequivalent Control Group Design as described by Campbell and Stanley (1966, pp. 47-50) was used. Pre-treatment (0_1,0_3) and post-treatment (0_2,0_4) scores were collected using the three instruments described in the following section. The two levels of the independent variable were beginning vo-ag teachers in a structured teacher supervision program (X_1) and beginning vo-ag teachers not in a structured teacher supervision program (X_2). The design is illustrated as follows:

$$\begin{array}{ccc} 0_1 & X_1 & 0_2 \\ \hdashline 0_3 & X_2 & 0_4 \end{array}$$

Instrumentation

Three research instruments were used in the study. The primary investigation centered around differences between participants in the beginning teacher supervision program and teachers in the comparison group with regard to job satisfaction, as measured by the Brayfield and Rothe Index to Job Satisfaction (Miller, 1977, pp. 368-370), and teaching clarity as measured by an index developed by the researchers based upon findings from previous research conducted by Cruickshank et. al. (1975).

As there was concern for a threat to the internal validity of the study due to the effects of other programs which may have been sponsored by the teachers' own school systems, a third instrument was used in an attempt to study any possible effects of "school induction programs" in which the teacher may have participated. The instrument consisted of two separate parts. The first part was a series of questions which attempted to quantify the number of induction activities the schools offered to their new teachers. The second part of the instrument attempted to measure teacher perceptions as to the effectiveness of their schools' efforts.

Each instrument was pilot tested prior to its use and reliability data were collected. The alpha values were deemed acceptable (Anastasi, 1982). Table 1 reports the alpha coefficients for the pilot testing.

The Sample

Fifty-eight beginning vocational agriculture teachers who had previously taught for no more than two years were utilized in the study. Twenty-three teachers participated in a structured supervised beginning teacher program (treatment group). A second group of 35 teachers with similar undergraduate backgrounds and similar teaching situations to those in the treatment group served as a comparison group. None of the teachers in the comparison group had ever participated nor were currently participating in a structured beginning teacher program.

Table 1. Alpha Coefficients Calculated for Instruments Used in the Pilot Testing.

Instrument	Purpose	Cronbach's Alpha	Number of Cases
Teaching Clarity (Modified from Cruickshank)	Obtain pupils' perceptions of teacher clarity	.84	88 pupils
Job Satisfaction (Brayfield & Rothe Index)	Obtain teachers' perceptions of job satisfaction	.88	23 teachers
School Induction* (Part 2 only)	Obtain teachers' perception of their schools' induction programs	.88	23 teachers

*The calculated alpha coefficient for the school induction program index was based upon responses to the last 11 items on the index. The first 6 items in the index represented a summative score which did not constitute a scale.

In an attempt to assess the beginning equivalency of the participants in the two treatment groups, multivariate analysis of variance was used to analyze pre-treatment scores on the job satisfaction and teaching clarity indices. The significant differences described in Table 2 (F = 3.443; df = 4,102; p. = .011) suggests that it was appropriate to use the Nonequivalent Control Group Design in an effort to control possible threats to the validity of the study.

Table 2. Pre-Treatment Difference Between Treatment and Comparison Groups by Years of Teaching Experience with Regard to Job Satisfaction and Teaching Clarity.

Group No.*	Group	n	Job Satisfaction		Teaching Clarity	
			$\bar{x}$	s.d.	$\bar{x}$	s.d.
	Treatment					
1	0 yrs. exp.	8	72.62	6.72	79.87	7.88
2	1 yr. exp.	8	68.62	3.30	79.50	6.41
3	2 yrs. exp.	7	68.14	6.36	75.00	11.15
	Comparison					
4	0 yrs. exp.	10	62.80	9.38	75.50	3.50
5	1 yr. exp.	12	70.08	4.76	81.83	3.93
6	2 yrs. exp.	13	71.31	8.57	81.54	5.46
	Entire Sample	58	69.02	7.42	79.26	6.66

$F_{interaction}$ = 3.443, df = 4, 102, p. = .011

* Significant differences exist between group numbers 1 and 4, 4 and 5, and 4 and 6 for job satisfaction. Significant differences exist between group numbers 3 and 5, 3 and 6, 4 and 5, and 4 and 6 for teaching clarity. (Differences determined by 95 percent simultaneous confidence interval test).

ANALYSIS OF DATA

Multivariate analysis of covariance was used to examine the main effects and interactive effects of the treatment level (participating or not participating in the beginning teacher program), with years of teaching experience, and the two parts of the school induction program index upon job satisfaction and teaching clarity. The use of the covariance technique is particularly appropriate in quasi-experimental designs which do not utilize random sampling or assignments when analysis of pre-treatment data indicate differences between the treatment and comparison groups.

RESULTS

The first hypothesis test explored the main and interactive effects of treatment level and years of teaching experience upon adjusted scores on the job satisfaction and teaching clarity indices. Table 3 reports the results of this hypothesis test. The multivariate analysis was not significant by the Wilks Lambda criterion (F = .675; df = 12,98; p. = .771). Data in Table 3 indicate no reason to conclude that treatment level or years of teaching experience had any main or interactive effects upon scores for the job satisfaction index or the teaching clarity index. The adjusted mean satisfaction scores were 68.0 and 67.2 for treatment and comparison groups respectively (scores could have ranged from 18-90). The adjusted clarity scores were 76.2 and 75.1 for treatment and comparison groups, respectively (scores could have ranged from 21-105).

Table 3. MANOVA Summary Table for the Effect of Treatment Level and Years of Teaching Experience Upon Post-Treatment Scores for the Job Satisfaction Index and Teaching Clarity Index When Controlling for the effect of Pre-Treatment Scores on Both Indices.

Source	Adj. SS_{JSI}	Adj. SS_{TCI}	df	F	p
Covariates	2215.55	1612.68	4	19.58	<.001
Model	362.17	55.38	12	.68	.771
Mean	6.20	2.91	2	.11	.899
Treatment	11.41	12.31	2	.22	.801
Yrs. Exp.	122.61	34.55	4	.87	.486
Trtmt. x Yrs. Exp.	232.17	7.65	4	1.07	.376
Error	2633.06	2060.49			

The second hypothesis test explored the main and interactive effects of treatment level and the first part of the school induction program index upon job satisfaction and teaching clarity. (This part of the school induction program index tabulated a weighted score based upon the number of induction activities that schools sponsored for their beginning teachers). Table 4 reports the results of this hypothesis test. Again the multivariate analysis was not significant by the Wilks Lambda criterion (F = 1.14; df = 12,98; p. = .340). As with the previous analysis, there were no data in Table 4 which suggested that the number of school-sponsored induction activities or treatment level had any main or interactive effects upon scores for the job satisfaction index or the teaching clarity index. The adjusted mean satisfaction scores were 67.5 and 66.7 and the adjusted mean clarity scores were 75.8 and 74.9 for treatment and comparision groups, respectively.

The final hypothesis test explored the main and interactive effects of treatment level and the second part of the school induction program index upon the dependent variables. (This part of the school induction program index quantified the teachers' perceptions regarding the effectiveness of school-sponsored induction activities). Table 5 reports the results of this analysis. Although the level of significance for the overall model did not reach .05 alpha, it did approach rejection level ($F = 1.79$; df = 12,98; $p. = .060$). However, the explained variance is accounted for by the main effects of the school induction program index (part 2), and this finding was of little consequence to the study's objectives. This index and the other moderating variables were added to the models to explore the possible interactive effects they may have with treatment level upon the dependent variables. The follow-up confidence interval test indicated that teachers who had a lower perception of their schools' induction programs were also less satisfied with their jobs.

Table 4. MANOVA Summary Table for the Effects of Treatment Level and Scores on the First Part of the School Induction Program Index Upon Post-Treatment Scores on the Job Satisfaction Index and the Teaching Clarity Index When Controlling for the Effects of Pre-Treatment Scores on Both Indices.

Source	Adj. SS_{JSI}	Adj. SS_{TCI}	df	F	p
Covariates	2083.67	1533.48	4	19.94	<.001
Model	233.75	342.62	12	1.14	.340
Mean	4.20	28.56	2	.48	.669
Treatment	8.44	13.59	2	.23	.793
SIPI (pt. 1)	149.22	169.29	4	1.78	.138
Trtmt. x SIPI (pt. 1)	59.27	154.95	4	1.46	.221
Error	2711.48	1773.26			

Table 5. MANOVA Summary Table for the Effects of Treatment Level and Scores on the Second Part of the School Induction Program Index Upon Post-Treatment Scores on the Job Satisfaction Index and the Teaching Clarity Index When controlling for the Effects of Pre-Treatment Scores on Both Indices.

Source	Adj. SS_{JSI}	Adj. SS_{TCI}	df	F	p
Covariates	1844.44	1763.27	4	20.63	<.001
Model	872.70	82.77	12	1.79	.060
Mean	22.81	5.01	2	.29	.750
Treatment	13.81	10.81	2	.25	.781
SIPI (pt. 2)	844.81	69.39	4	5.16	.001
Trtmt. x SIPI (pt. 2)	10.48	.75	4	.06	.993
Error	2122.53	2022.10			

CONCLUSION AND RECOMMENDATIONS

It was concluded that participation in the structured beginning teacher supervision program did not significantly enhance teachers' levels of job satisfaction or students' perceptions of their teachers' ability to teach with clarity.

Although analysis of these data failed to reveal significant differences between the treatment and comparison groups with regard to job satisfaction and teaching clarity, one must always consider the possibility that the program may have had an impact which was not measured. This may be due to error in measurement as a result of invalid instrumentation.

The Brayfield and Rothe Index proposed to measure "general" job satisfaction. It is quite possible that there were other "less global" aspects of job satisfaction that teachers in the treatment group may have experienced which the instrument failed to measure. There are aspects of relative satisfaction that may be measured at any given point in time which teachers may have experienced as the result of a particular piece of information gained from instructional supervision. Post-treatment measures administered at the end of a school year would fail to take such satisfaction into account.

The teaching clarity index proposed to measure a teacher's ability to teach clearly as perceived by his/her students. Research indicates that clarity is only one of the numerous measures of teaching performance which is related to student learning. Time-on-task, teacher enthusiasm, and organizational management (Cruickshank et. al., 1975) are all attributes of teaching performance which could have been measured and analyzed as part of the evaluation.

Finally, one must consider the possibility that other moderating variables may impact interactively with treatment level to explain greater differences in job satisfaction and teaching clarity. For example, all the University supervisors were male, and 26 percent of the teachers in the treatment group were female. Although it was not considered during the study, gender may have proven to interact with treatment. School climate may also interact with treatment level. It is logical to predict that good instructional supervision may impact upon teachers who teach in school climates which are conducive to learning, while little or no impact could be found upon teachers who teach in less conducive climates.

Recommendations for Further Study

Based upon the results of this study, the following recommendations for further study are proposed.

1. Additional measures of teaching performance should be considered as possible indicators of program success.
2. Additional factors should be considered as possibly interacting with treatment level to impact upon job satisfaction, teaching clarity, or other measures of teaching performance.
3. Validity data should be developed for the teaching clarity index.

A similar instrument currently being developed by Hines et. al. (1985) and the instrument used in this study could logically be incorporated into additional studies in an effort to develop convergent validity data as well as additional reliability data on both instruments.

Consideration for Program Improvement

One must also consider the possibility that the beginning teacher program was not as successful as it could have been with regard to its original aim of improving teaching performance and job satisfaction. A closer look at what actually took place during the year suggests a need for some improvements in the program itself.

One must question the heterogeneity found to exist in the program with regard to number of supervision visits and length of time spent actually working with each teacher. Some teachers were visited only twice during the school year. It is doubtful that those teachers were able to benefit from such limited instructional supervision. Other teachers were visited five and six times during the same year. The opportunity for change was much greater for these teachers.

It was decided very early in the program that the nine University supervisors should meet frequently to discuss supervision strategies and focus attention on common problems. These meetings were unable to take place because each supervisor had other day-to-day teaching and advising responsibilities as well. There was not sufficient time to hold these meetings.

Finally, supervisors differed with regard to the amount of training they had in instructional supervision. Each supervisor had taught vocational agriculture and could identify problems that teachers should address. However, supervisors did not necessarily deal with these problems in an appropriate supervision framework.

Recommendations for Program Development

Based upon these observations and the inability of the study to find any evidence to support the hypotheses that the program had an impact upon the teachers, the following recommendations are offered to those persons responsible for conducting the beginning teacher supervision program.

1. There needs to be a clear delineation of program objectives from which the supervisors may operate.
    a. Specific objectives should identify measurable areas of teaching performance to be focused upon during the program.
    b. Seminars and/or workshops for teachers should be designed with these objectives in mind. Teachers should be strongly encouraged to attend these seminars.
    c. Program evaluation should reflect these objectives as well, once they have been identified.
2. There needs to be a clearly defined and closely followed delivery

system for the program.

a. In light of problems associated with program delivery attributed to supervisors having other responsibilities in the Department, consideration should be given to having one or two faculty members assigned full time to delivering the beginning teacher supervision program.

b. Regardless of the number of faculty participating in the program, a regular time period should be set aside for supervisors to discuss strategies and collectively work on supervision problems.

c. Although graduate assistants should be encouraged to assist with the beginning teacher program, each assistant should have a minimum of 3-6 credits of formal coursework in instructional supervision plus classroom experience in teaching vocational agriculture prior to supervising beginning teachers.

d. Although faculty members may be qualified to make recommendations to teachers concerning instructional improvement, consideration should be given to providing additional faculty inservice regarding the various modes of supervision that may be most effective with the majority of young teachers.

A primary function of any program evaluation is ultimately the improvement of that program. The results of this study provide the basis for further beginning teacher program planning and improvement.

# # #

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IMPACT OF BEGINNING TEACHER SUPERVISION ON VOCATIONAL AGRICULTURE TEACHER PERFORMANCE

A CRITIQUE

Richard I. Carter, Iowa State University--Discussant

This research addressed evaluation of beginning teacher programs in Pennsylvania using a Nonequivalent Control Group Design. Assignment of teachers with less than two years experience to groups was based on their participation or lack of participation in a program sponsored for beginning teachers. Instruments used in the study measured job satisifaction and teaching clarity along with a measure of activities sponsored by the teachers' own school systems.

Strengths

1. The research topic is relevant and timely to agricultural education. The topic relates directly to issues being raised in education today. The researchers provided a concise, yet appropriate introduction which set the stage for the study.
2. The researchers utilized and built upon research conducted by others in developing the research instruments. Instruments were pilot tested with similar groups and reliability data were presented.
3. The researchers took efforts to select and test an appropriate design for the groups used since the groups were self-selected rather than randomly selected. Statistical analyses used in the study were appropriately administered and interpreted.
4. Conclusions and implications were confined to the subjects included in the study.

Weaknesses

1. Discussion of the methods and procedures did not clarify the relationship of treatment (whether they enrolled in a beginning teachers program or not) and when the instruments were administered. When were the pre-treatment scores obtained from the subjects?
2. What were the objectives of the beginning teacher program in which the members of treatment group were enrolled? Did the objectives relate to "teaching clarity" and "job satisfaction" which were the criteria for evaluation of the comparison between groups? It appears an assumption was made that the objectives of the program included development in the areas of teaching clarity and job satisfaction.
3. Discussion of why there were no differences seem to be of great concern to the researchers. Would they be as concerned if a significant difference had been found?
4. The researchers identified considerations and recommendations for program improvement and development based on a rather narrow evaluation of the beginning teacher program. Granted, the criteria used in the study are important, but not to the extent of remodeling the entire beginning teacher program.

INDICATORS OF QUALITY USED FOR FACULTY SELECTION IN DEPARTMENTS OF AGRICULTURAL EDUCATION

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INTRODUCTION

Administrators of departments in agricultural education have many functions, one of the most important is the selection of new faculty. The selection of new faculty has been compared to a poker game, one that is filled with uncertainty and anxiety for both the department and the candidates (Caplow and Mcgee, 1958). Uncertainty and anxiety arise because the rules of the game are not always clear.

Faculty selection decisions are made on a variety of personnel data. These data are often assumed to be indicators of quality. What data department heads consider most important in their decision making process is still a question. The current NCATE standards include minimums of academic preparation, scholarly performance and experience (NCATE, 1982). How the total NCATE standards are interpreted and used in the hiring process is unclear.

The qualities decision makers should and do look for in candidates have been the subject of some research and writing in the past, and a part of many administrative texts (Caplow & McGee, 1958; Carroll & others, 1978; Poort, 1979; & Wolansky & DuVal, 1974). Which faculty related variables are currently utilized by department heads at the time of employment and how those vary with the type of institution should be of interest to employers and candidates alike.

Moore (1985) surveyed chief administrators in colleges or schools of education as to the indicators of quality they used in faculty selection. The eight critera that ranked highest in that study were (a) preparation in area of specialization, (b) unquestionable personal integrity, (c) number of publications in refereed journals, (d) specificity as to previous teaching assignments and type of institution in which they occurred, (e) supervisor statements, (f) emotional stabililty, (g) formal presentation in a seminar setting during interview process, and (h) high energy/motivational level.

How these criteria correlate with what happens in a more closed profession, such as agricultural education, is not clear. Sources of distortion, such as preferential treatment by prior association or institutional nepotism (Poort, 1971), may be present in the hiring process when the profession is smaller and the individuals involved more intimately acquainted.

PURPOSE AND OBJECTIVES

The purpose of this study was to determine which faculty-related variables are most frequently used by agricultural education program administrators as indicators of quality at the time of employment. A further purpose of this study was to determine if differences exist due to the demographic variables of the department. The following research questions were addressed:

1. What are the indicators of quality used for faculty selection in departments of agricultural education?

2. Do quality indicators used vary by school or college where the department is administered?

3. Do quality indicators used for faculty selection vary based on the demographics of the department (region, land grant and non-land grant institution, department size, and program administrator background)?

4. What data sources and procedures are most important in the final employment decision?

PROCEDURES

The population for the study was chief administrators, individuals responsible for hiring new faculty, of departments of agricultural education throughout the United States. Data were obtained through the use of a mailed questionnaire sent to all individuals identified as department heads in the American Association of Teacher Educators in Agriculture (AATEA) Directory. Individuals were asked to return the instrument with the name and address of the person in charge of hiring new faculty if that was not part of their job description. The survey was conducted during the spring of 1986.

The instrument was developed by Moore (1985), and was pilot tested and revised by a panel of experts, including the American Association of Colleges of Teacher Education (AACTE) Board of Directors. The original instrument was reviewed by agricultural education faculty. Individual items were not changed but the format was modified to improve readabilty.

The instrument consisted of 56 indicators of quality clustered into eight categories: academic preparation, professional experience, evidence of scholarship, documentation of teaching effectiveness, personal qualities, service activities, candidate's personal professional development and leadership qualities. The instrument had Cronbach's alpha reliability coefficients varying from .86 to .94 on the eight category subsets. Each indicator received two responses; the indicators importance in making final employment decisions and, second, on rank order of importance in the decision making process. The importance of indicators was evaluated on a five point scale, (5) essential to (1) no value or opinion. Secondly, respondents were asked to rank order from 1 (high) to 6 (low) the six most important indicators in each category. In the second part of the instrument respondents were asked to indicate the eight most important indicators used in faculty selection as well as to rank order the eight categories as to their overall importance in faculty selection. Respondents were also asked to rank order data collection sources and procedures as to their use in the final employment decision.

Instruments were mailed to 94 department heads identified in the AATEA directory. Four instruments were returned indicating no functional agricultural education departments. Non-respondents were followed up and found not to be different but data was not included. Post hoc tests were used to compare demographic groups. Usuable responses were received for a 75% response rate.

DATA ANALYSIS

Data analysis included ranks and frequencies. The Kruskal-Wallis one-way ANOVA by ranks was used for comparing groups. The alpha level was set a priorally at $p<.05$.

RESULTS

Chief administrators of agricultural education departments rated 13 of 56 quality indicators as valuable to essential (mean over 4.0) in making final employment selection divisions. Ratings were made with the assumption that the candidate has a doctorate degree. The quality indicators rated highest as indicated on Table 1 were (a) unquestionable integrity (4.6), (b) compatibility with colleagues (4.4), (c) high energy and/or motivational level (4.5), (d) supervisor comments (4.5), (e) emotional stability (4.4), (f) preparation in the area of specialization (4.4), (g) peer/colleague comments (4.3), (i) performance in assignments which reflect leadership activities (4.2), (j) colleague esteem of applicant (4.2), (k) publications in refereed journals (4.1), (l) conduct and quality of advising responsibilities (4.1), and (m) acceptable moral beliefs (4.0).

Table 1

Ranking Quality Indicators Used in Faculty Selection (n=67)

Indicator	Mean
1. Unquestionable integrity	4.6
2. Compatability with colleagues	4.5
3. Supervisor comments	4.5
4. High energy/or motivational level	4.4
5. Emotional stability	4.4
6. Preparation in the area specialization	4.4
7. Peer/colleague comments	4.3
8. Willingness to accept/consider divergent ideas and concepts	4.3
9. Performance in assignments which reflect leadership activities	4.2
10. Colleague esteem of applicant	4.2
11. Conduct and quality of advising responsibilities	4.1
12. Publications in refereed journals	4.1
13. Acceptable moral beliefs	4.0

Chief administrators of agricultural education departments administered in colleges of agriculture rated two quality indicators as significantly more important than administrators of departments administered in colleges of education or with joint appointments. The two quality indicators shown on Table 2 were supervisor statements and committee appointment or special assignments within the academic community.

Table 2

Mean Rank of Quality Indicators by Department Administrators

	Administration			
Indicator	College of Agriculture (n=46)	College of Education (n=20)	Joint Appointment (n=5)	χ^2
Supervisor comments	38.5	26.8	31.3	6.1
Committee appointments or special assignments	39.1	26.0	23.7	7.6

$p < .05$

Several quality indicators were found to vary significantly in importance based on the demographics of the department. Land grant institution chief administrators rated the importance of a publication in refereed journals higher in the hiring process than non-land grant. Those administrators in non-land grant institutions placed more importance on the nature of the masters degree and committee responsibilities at the school, college and department level as shown on Table 3.

Table 3

Mean Rank of Indicators by Type of Institution

Indicator	Land grant (n=48)	Non-land grant (n=29)	χ^2
Nature of masters	31.1	41.1	3.7
Publications in referred journals	37.2	26.0	4.5
Community responsibilities at the SCDE level	29.6	45.2	8.8

$p < .05$

Chief administrators in the southern region responses rated racial/ethnic background and involvement in non-professional community service activities significantly more important in the final employment decision than those in the central region (Table 4).

Table 4

Mean Rank of Indicators by Type of Institution

Indicator	Region Western (n=21)	Central (n=18)	Southern (n=14)	Eastern (n=14)	χ^2
Racial/Ethnic Background	36.6	24.4	44.1	32.3	8.6
Involvement in non-professional community service	36.1	27.6	44.8	28.29	7.7

$p < .05$

The background or faculty appointment of the chief administrators was found to show significant differences in three areas (Table 5). Chief administrators with non-agricultural education backgrounds rated formal presentations in a seminar setting during the interview process and serving as a paid consultant for agencies other than the parent institution as more important indicators of quality than chief administrators with agricultural education backgrounds.

Those administrators with agricultural education backgrounds rated data obtained via systematic student evaluations as more important indicators of quality than the program administrators with other backgrounds or appointments. Quality indicators used for faculty selection did not vary based on department size as measured by FTE's.

Table 5

Mean Rank of Indicators by Chief Administrators Background

Indicator	AG ED (n=57)	Other (n=9)	χ^2
Data obtained via systematic student evaluation	35.9	21.5	4.3
Formal presentations in a seminar setting during the interview process	32.0	46.8	4.5
Paid consultancies for agencies other than parent institution	31.6	49.8	6.8

$p < .05$

The data sources and procedures ranking in the top five in the final employment decisions shown on Table 6 were (a) oral recommendations obtained by the hiring administrator from current or former employer (mean 4.3), (b) report of a search/screening committee (mean 4.1), (c) vita submitted by applicant (mean 4.1), (d) oral recommendation obtained from a known professional (mean 4.0), (e) written recommendations obtained by the administrator (mean 3.9). The data source rated the lowest as seldom used was credential files which have been reviewed by the applicant (mean 3.0).

Table 6

Ranking of Data Sources/Procedures Used in Faculty Selection (n=67)

Data Source		Mean
1.	Oral recommendations obtained by the hiring administrator from current or former employer	4.3
2.	Report of a search/screening committee	4.1
3.	Vita submitted by applicant	4.1
4.	Oral recommendation obtained from a known professional	4.0
5.	Written recommendations obtained by the administrator	3.9
6.	Credential file which is confidential	3.8
7.	Application obtained by nomination or invitation	3.6
8.	Self-initiated applications	3.6
9.	Recommendations submitted at the request of the applicants	3.4
10.	Credential file which has been reviewed by applicant	3.0

CONCLUSIONS AND RECOMMENDATIONS

Based on the data obtained from chief administrators of agricultural education departments in the United States in 1986 personal qualities and documentation of teaching effectiveness as evidenced by supervisor comments and peer/college comments carried the most weight in final hiring decisions.

Department administration was a significant factor on two quality indicators, only one of which, supervision comments, was rated above 4.0 in the decision making process. This indicator was rated higher by department administrators in colleges of agriculture.

Quality indicators used for faculty selection varied based on the demographics of the department on six quality indicators. The only quality indicator that varied significantly with department demographics which rated as "valuable" was publication in refereed journals, which was rated higher by land grant institutions.

Data obtained by the personal contacts of the person in charge of hiring, in addition to the search committee and vita, have the greatest effect on final employment decision.

The data indicate that agricultural education is a relatively closed field with data from personal contacts and the applicants personal qualities considered more important in the hiring process than academic preparation and service activities. These data have implications for applicants as they begin the job search process and in applying for specific jobs. Knowledge of administrators background and the demographics of the institution to which applicants are applying would be useful in preparing vita and other materials for application process.

The data also have implications for institutions preparing doctoral candidates. Activities and experiences should be provided which will enhance the candidate's program and increase their desirability as faculty members to hiring institutions.

Additional research is recommended to compare the quality indicators used by chief administrators in agricultural education departments, Deans of Education, and Deans of Agriculture in the hiring of faculty.

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Indicators of Quality Used for Faculty Selection in Departments of Agricultural Education
A Critique

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This study was viewed as one which can be of considerable benefit to administrators charged with the final decision in the hiring process, faculty members who are employed at the various institutions, and prospective faculty. The introduction developed the problem and led into a statement of that problem; however, there were some extraneous and inconsistent statements which may have improved the introduction by their omission. For example, the researcher suggested that selection of faculty may be compared to that of a poker game, one that is filled with uncertainty and anxiety for both the department and the candidates, and on the other hand, indicated studies had been completed which explicitly outlined the important areas of consideration used in faculty selection. In the introduction the author suggested the possibility of preferential treatment by prior association or institutional nepotism, yet this possibility was not addressed in the research design, nor was it suggested as a possibility when drawing conclusions and making recommendations with regard to the research findings. Also, it was interesting that a list of eight indicators of quality used in faculty selection was documented in research by Moore (1985), and it was suggested that how these criteria correlate to what happens in a more closed profession was unclear. This situation was not addressed in the research design or results. Thirteen new indicators emerged in the results with no mention of comparison or correlation. The researcher is to be complimented, however, for extensive instrument design and procedures by which an immediate feeling of credibility was conveyed to the reader which provided a sense of confidence in the research as the data was reported.

It should be noted that the procedures were clearly outlined and well defined with minimal text, an accomplishment which is seldom reached in most manuscripts. Table 1 and Table 6 were the most meaningful in the presentation of results and while Tables 2-5 were important, it would have been beneficial to the reader to have received more information on "categories" as indicated in the procedures, instead of discussion centering primarily around "indicators." Perhaps a narrative concerning data imparted from Tables 2-5, with additional table space reserved for categorical discussions would have been of benefit.

The conclusions and recommendations were very well written in a clear and succinct manner. The objectives of this study as outlined were answered. It was disappointing, however, that additional research was recommended to compare the quality indicators used by Chief Administrators in agricultural education departments, Deans of Education, and Deans of Agriculture in hiring faculty since the introduction prompted the reader to believe this question would be addressed in this research effort.

In conclusion, this paper addressed a subject of utmost importance as we continually strive to assemble the best faculties possible at our respective institutions.

MICROCOMPUTER USE IN VOCATIONAL AGRICULTURE PROGRAMS IN THE UNITED STATES

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INTRODUCTION

The number of vocational agriculture programs with microcomputers continues to increase as this technology gains support from school systems and as a result of the Perkins Vocational Education Act. This is logical and necessary since agricultural applications for computers are constantly being developed and implemented. As more agriculture departments obtain computers, the question arises as to what should be taught with and about the machines.

Research and evaluation of microcomputer use in education is extensive, but has been restricted largely to the computer's use in academic subjects. Taylor (1980) outlined three basic areas for microcomputer use in education - as a tutor, as a tool, and as a tuttee. Using the computer as a tutor refers to presentation of instructional units by the machine, a procedure commonly referred to as computer-aided instruction (CAI). The instructional management tasks such as materials preparation, word processing and data base use are examples of the computer's use as a tool. The third area of computer use, as a tuttee, involves students learning the language of the machine and having them "teach" the computer to perform desired functions.

Two of the three previously mentioned microcomputer uses have been addressed in agricultural education research. Neason and Miller (1982) indicated that the microcomputer's most profitable use was as a management tool. Specific uses of this type noted by McGrann (1980) include decision making, education, communication, data gathering, data analysis, monitoring, evaluation and data retrieval and storage.

The second microcomputer use employed by agricultural educators is using the machine as a tutor. Hudson (1980) specifically addressed computer aided instruction in agricultural education. He found that major uses included drill and practice, tutorial use, simulations, games, testing, and recording data. In a later study, Hudson (1983) compiled a list of 50 microcomputer use skills needed by agricultural computer users.

Utilizing Hudson's (1983) list of competencies, Sutphin (1984) surveyed New York vocational agriculture teachers to determine their opinion of the importance of these skills as well as the teachers' actual level of microcomputer usage. Information regarding other computer use factors was also obtained.

In another study of computer competencies needed by vocational agriculture teachers, Miller and Foster (1985) asked Iowa and Nebraska vocational agriculture teachers to classify 50 microcomputer competencies. The teachers classified 24 of the 50 competencies as "important."

While these studies have addressed microcomputer usage and the importance of specific microcomputer use skills at the state level, several needs still exist. These include a need to determine how microcomputers are being used in vocational agriculture programs across the United States and a need to determine the current level of use of the microcomputer in vocational agriculture programs in the United States. This study was designed to make these determinations.

PURPOSE AND OBJECTIVES

The purpose of this study was to determine the competencies deemed most important for practical microcomputer use by secondary vocational agriculture teachers in the United States and to determine the current uses of microcomputers. The objectives were:

1. Determine the extent to which microcomputers are used in secondary vocational agriculture programs in the United States.
2. Determine vocational agriculture teachers' perceptions of the importance of selected microcomputer use competencies in vocational agriculture programs.
3. Determine if differences exist between the demographic characteristics of those teachers who had microcomputers in their vocational agriculture departments and those who did not. The demographic characteristics used in this analysis were years teaching experience, age, number of students in high school, number of students in the vocational agriculture program, and the teacher's opinion of his school board's and principal's support for computer use.

PROCEDURES

The population (N=12,500) consisted of all secondary vocational agriculture teachers in the United States as listed in the 1984 Agriculture Teacher's Directory (Henry, 1985). Cochran's sample size formula (Snedecor and Cochran, 1980) was used to select a minimum returned sample size of 173. Since this was a national study, a systematic random sample of 312 was used in anticipation of a low response rate. A response rate of 212 (68.4%) was realized after two mailings and a phone follow-up. Analysis of variance was used to determine if differences existed among the demographic characteristics of the three groups of respondents (2 mailouts and 1 phone follow-up). Since no differences were found, it was determined that the respondents were representative of the population and the data were combined.

A questionnaire based on instruments developed by Sutphin et al. (1984) and Hudson (1983) was developed to secure the information needed for the study. The instrument was field tested using 15 vocational agriculture teachers. Changes indicated by the field test were incorporated into the instrument. Instrument reliability was assessed using Cronbach's Alpha and resulted in estimates of $r = .86$ for the Likert scale items rated according to the respondent's level of agreement and $r = .91$ for the Likert scale items rated according to the importance of selected competencies. Data analysis were conducted with the SPSS-X statistical analysis program (SPSS, Inc., 1983) and included descriptive statistics and inferential t-tests (Alpha = .01).

RESULTS

Thirty-nine percent of the respondents indicated that they had computers located in their department. Forty-nine additional respondents (23%) indicated that they used computers located either in school, at home or some other location such as a college with increased the proportion of teachers using computers to 62%. An average of 1.6 computers per department were reported by those departments with computers. Apple was the main brand of computer reported by the teachers as being in their departments (64.7%) followed by TRS-80 (14.3%) and Atari (9.8%) with a variety of other brands accounting for the remaining 11.2%. Apple and TRS-80 were also the main brands that were available to the respondents at home and in their school. Twenty respondents indicated that they expected to acquire their first or an additional microcomputer for their department within the coming year.

Hardware/software availability factors were addressed by those teachers who were using computers. The respondents agreed with only one of the seven statements in this area. They gave a rating of 3.95 (agree) to the statement that the types of computers that can do the operation needed are available. The ratings on all other factors fell between 2.5 and 3.5 on the scale which was interpreted as undecided. These data are presented in Table 1.

Table 1

Computer Hardware and Software Availability for Teachers Using Microcomputers

(n = 132)

Availability factor	Mean[a]	S.D.
Types of computers that can do the operations needed are available	3.95	1.19
Program management software is available	3.31	1.29
Agricultural software is available	3.29	1.23
Software needed for instruction is available	3.24	1.22
Adequate access to computers for needs is available	3.11	1.36
Adequate numbers of computers for needs are available	3.03	1.31
Multiple copies of software needed for instruction are available	2.88	1.30

[a] 1 = "strongly disagree", 5 = "strongly agree"

Teachers were asked about their use of computer aided instructional practices. As the data in Table 2 indicate, the largest percentage of teachers used the computer for problem solving. This practice was used an average of 8.2 hours per month by over half (78 out of 132) of the teachers who used computers. Other computer aided instructional practices used were educational games (9.0 hours), tutorial presentations (8.4 hours), and simulations (6.0 hours). The latter practices were used by fewer teachers.

Computer aided instructional management practices such as instructional materials preparation, word processing and data base use were employed equally as often by teachers. An average of 64 of the 132 teachers using computers employed these practices for 9.5 hours each month. Average hours of student use was also approximately 9 hours per month, however, fewer students used these practices than did teachers. These data are also presented in Table 2.

Table 2

Average Monthly Use of Computer-Aided Instruction and Computer-Aided Program Management by Students and Teachers ($\underline{n}$ = 132)

	Hours used					
	By students			By teachers		
Practice	Mean	S.D.	n	Mean	S.D.	n
Computer-aided instruction						
Problem solving	9.27	10.8	85	8.22	10.2	78
Tutorial presentation	9.23	11.0	70	7.51	8.8	61
Simulations	6.73	2.4	51	5.15	5.5	46
Educational games	9.88	17.1	50	7.33	15.5	27
Communicating w/other computers	8.46	8.5	11	10.07	15.1	15
Other uses	11.3	5.2	3	9.38	12.9	8
Computer-aided management						
Instructional materials prep.	9.34	9.5	41	10.03	11.3	66
Word processing	10.29	10.0	34	10.05	9.5	66
Data base use	7.80	6.40	25	8.59	6.7	61

Twenty computer use competencies were rated by respondents as to their importance. Those found to be most important were use of the keyboard, disk drive and printer, all hardware use competencies. Using software to maintain records ranked fourth followed by identification of agricultural and home use software and use of agricultural and home use software. These data are presented in Table 3.

The data in Table 4 reveals that approximately 40% of the teachers who had used computers could use agricultural software, word processors, and spreadsheets while only 28.7% could use data bases. The percent of teachers who taught the use of these programs and the percent of their students who could use these programs ranged from 2.4 to 29.5%.

Inferential $\underline{t}$-tests were used to determine if differences existed between those teachers who had computers in their departments and those who did not. No significant differences existed for the variables age, years of teaching experience, number of students in the school, and number of students in the vocational agriculture department. Significant differences did exist for two variables. Those teachers who had computers perceived that their school board and principal supported the use of computers to a greater extent than those who did not have computers. These data are presented in Table 5.

Table 3

Teachers Opinions of Importance of 20 Microcomputer Use Competencies (n = 128)

Competency	Mean[a]	S.D.	Rank
General knowledge			
Use an operator's manual	3.89	.98	7
Define microcomputer terminology	3.35	1.05	13
Identify networking opportunities in the community	2.92	1.01	15
Perform maintenance on computers	2.25	1.12	20
Hardware use			
Use the keyboard	4.22	.87	1
Use the disk drive	4.16	.86	2
Use the printer	4.12	.82	3
Demonstrate microcomputer operation	3.77	.97	8
Communicate with other computers	3.06	1.16	14
Use the cassette recorder	2.74	1.26	16
Describe the difference among brands and models	2.72	.88	17
Use the graphics tablet	2.60	1.03	19
Software use			
Use software to maintain records	3.98	.89	4
Use agricultural/home use software	3.92	.89	5
Identify agricultural/home use software	3.92	.96	6
Evaluate agricultural/home use software	3.69	.98	9
Use computer as a word processor	3.52	1.00	10
Organize a software library	3.42	1.03	11
Identify modifications needed in software	3.38	1.08	12
Write a program using BASIC or other language	2.69	1.25	18

[a] 1 = "no importance", 5 = "essential"

Table 4

Computer Program Use by Vocational Agriculture Teachers Who Use Microcomputers (n = 132)

Program type	Percent of teachers who can use program[a]	Percent of teachers who teach program use[a]	Mean percent of students who can use program[b]
Agricultural software	42.6	29.5	18.3
Spreadsheets	41.1	19.0	9.0
Word processing	40.2	12.9	6.9
BASIC for programming	30.6	14.3	8.3
Data base management	28.7	6.7	2.4

[a] Teachers checked all items that they used or taught the use of [b] Teachers indicated the percent of their students who could use each program listed

Table 5

T-tests of Demographic Characteristics by Whether Respondents had a Computer in the Vocational Agriculture Department

	Teachers with computers			Teachers without computers			
Variable	Mean	S.D.	n	Mean	S.D.	n	t
Years vo-ag teaching experience	12.3	8.0	78	12.4	9.2	126	0.07
Teacher's age	37.8	9.7	83	38.7	11.5	126	0.55
No. of students in high school	661.9	607.8	81	644.6	590.3	123	0.20
No. of students in vo-ag program	85.0	53.6	81	85.4	67.3	126	0.05
Your school board supports the use of computers[a]	4.2	.79	82	3.7	.92	125	3.93^{*}
Your principal supports the use of computers[a]	4.3	.76	82	3.8	.91	125	3.73^{*}

[a] Teachers responded to this item on a 5 point Likert type scale with 1 = "strongly disagree" and 5 = "strongly agree"

$^{***}p<.001$

CONCLUSIONS AND/OR RECOMMENDATIONS

1. The percentage of teachers who have computers in their vocational agriculture departments does not appear to be as high as the percentage reported by the National FFA Agricultural Computing Service (1985) which reported that 51% of the *programs* in the nation had computers. This study found that only 39% of the *teachers* in the sample had computers. In order for teachers to provide up-to-date programs for their students, state staff personnel should increase their efforts to provide or encourage local school districts to provide computers for vocational agriculture departments.

2. Vocational agriculture departments were more likely to have computers if the principal and school board supported the use of computers. State staffs should take this factor into consideration if they wish to increase the number of computers used in local vocational agriculture programs.

3. Computers currently in vocational agriculture programs are used more for instructional management (as a tool) than they are for tutorial or direct instructional purposes. Existing research findings on how to effectively incorporate the computer into the instructional environment should be used by teacher educators and state supervisors to aid teachers in using the computer to improve instructional effectiveness. Additional research should be conducted into how the computer can best be used in the instructional (classroom and laboratory) environment in vocational agriculture programs so that teachers can be better prepared to use them for instructional purposes.

4. Since most vocational agriculture departments had Apple (64.7%) and TRS-80 (14.3%) computers, teacher in-service and pre-service training activities should be conducted using one or both of these brands of computers unless evidence exists that this data is not valid for a particular state. This recommendation will remain in effect until these brands are no longer the main computers in use. (It should be noted that the National FFA Agricultural Computing Service has indicated that they will support MS-DOS computers in addition to these two brands).

5. The use of microcomputers in vocational agriculture departments is still in its infancy stage as evidenced by the low number of departments with computers and the low level of usage of the computer for program management and instructional purposes. Kulik, Bangert and Williams (1983) found that high school students who supplement their learning through the use of microcomputers learn more and get better grades on tests and in courses. Due to the urgent need for vocational agriculture programs to be efficient and up to date in both program management and instructional techniques, the National Association of Supervisors of Agricultural Education and the American Association of Teacher Educators in Agriculture should form a joint task force for the purpose of accelerating the introduction and advancement of appropriate computer usage in local vocational agriculture departments.

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Microcomputer Use In Vocational Agriculture In The United States

A Critique

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This research study was designed to assess the current status of microcomputer usage in vocational agriculture programs in the United States. The researchers are to be commended for completing a study of this scope in an effort to decribe where we are at in the use of computer technology.

Strengths Of The Study

The paper provides a thorough review of the literature, setting a good theoretical framework for the need for the study. The study is well designed, using acceptable research techniques for establishing the required sample size, comparisons of initial versus late respondents and for establishing reliability and validity of the survey instrument. These research procedures give us confidence that the results are worth considering and using to make appropriate decisions.

Research objectives are clear and the findings address the objectives. Statistical analysis is appropriate for the data reported and conclusions were appropriate for the findings reported.

The study provides information that supports previous research findings regarding microcomputer hardware and software usage, competencies, and commercial applications for vocational agriculture and should add to the already existing body of information in this area.

Areas In Need of Strengthing

As in most research reported using bipolar scales, (that is 1 = Strongly Disagree, 5 = Strongly Agree), mean values arond the midpoint of the scale need added interpretation. For example, one mean of 3.03 is reported as indicating respondents were "undecided", while a standard deviation of 1.58 really indicated that the actual scores were distributed throughout the scale, and respondents were definitely either in agreement or disagreement.

Percentages of teachers using selected hardware and software, as well as reporting actual hourly use of the computer was based on 132 observations (62% of the actual respondents and 42% of the sample size). By not reporting data as a proportion of the actual number of vocational agriculture instructors, the researchers tend to de-emphasize the impact of the low participation of vocational agricutlure instructors in computer usage on a national basis.

OCCUPATIONAL ASPIRATIONS OF THIRD YEAR VOCATIONAL AGRICULTURE STUDENTS

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INTRODUCTION

Each year, thousands of high school students throughout the United States schedule vocational agriculture as part of their secondary curriculum. With the variety of courses offered today, sometimes one wonders why students schedule the courses they do. Is it curiosity of the subject matter that draws their attention, or maybe the fact that there were no other courses available which fit into their schedules? It may be that the student has future aspirations to pursue a career in an area related to these courses.

It is usually during these high school years that students make one of the most important decisions of their lives--that being the choice of a career (Molnar & Dunkelberger, 1981). Scores of factors enter into this decision. Vocational teachers and/or courses they teach have the potential of playing an important role in this decision-making process (Dunkelberger, Molnar, & Adrian, 1981).

Pupils are offered the opportunity to begin preparation for their selected fields of work through subject matter learned in high school. No matter what the chosen area of work may be, a student's basic foundation may and should be developed while in high school (McCracken, Barrick, & Beard, 1984).

This basic foundation is developed from a combination of various factors. These factors may include items such as age, occupational aspirations, place of residence, educational plans, and parental occupation and education (Eaddy, 1968). The influence of specific factors on individuals may vary, but these factors as well as others do enter into the individual's development.

The knowledge of the aforementioned factors and influences may, in the future, help teachers to prepare students to achieve their educational and occupational ambitions.

PURPOSE AND OBJECTIVES

The purpose of this study is to determine the occupational aspirations of third year vocational agriculture students in Louisiana. The specific objectives of the study include:

1. to describe the population through use of various demographic factors;
2. to identify those persons bearing an influence on students' educational and occupational choices; and
3. to determine if relationships exist among selected demographic and career factors.

METHODOLOGY

Population and Sample

The population in this study was students enrolled in Vocational Agriculture III in Louisiana high schools during the 1984-85 school year. The vocational agriculture programs in the state were identified through the use of the "1984-85 Staff and Teachers' Directory" for Louisiana vocational agriculture teachers (prepared by the Louisiana State Department of Education). (Simmons, 1984)

As reported by the Louisiana State Department of Education-Vocational Agriculture Section, there were approximately 3,282 students enrolled in Vocational Agriculture III courses in Louisiana during the 1984-85 school year. According to Krejcie and Morgan (1970), the needed sample size for a population of this size is 341.

A stratified cluster sampling procedure was used for selecting the sample in the study. A random sample of 30 vocational agriculture programs was selected. These programs were stratified based on state FFA areas and was proportionally representative of the programs in each area.

Following the selection of vocational agriculture programs, a 100% sample of Vocational Agriculture III students within each program was selected. A letter was mailed to the vocational agriculture teachers in each of the 30 schools drawn for the sample. The letter included a brief explanation of the study and a request to participate in the study. The final decision regarding participation in the study was determined by a response from the teachers to two questions: "Do you have one or more students enrolled in Vocational Agriculture III?" and "Are you willing to participate?" A postcard, enclosed with the letter, was used by the vocational agriculture teacher for his/her response. Those that would participate in the study were also asked to indicate the number of Vocational Agriculture III students in their department.

Of the 30 programs selected, seven did not meet the criteria for participation in the study. Alternates were selected to replace those seven, and the alternates met both criteria for inclusion in the study.

Instrument

The instrument for the study consisted of questions dealing with personal information, self-related factors, family-related factors, school-related factors, and occupational and educational-related factors in career plans. This instrument was a modified version of the instrument used by Vanik S. Eaddy in his dissertation at Louisiana State University in 1968 (Eaddy, 1968).

Content validity of the instrument used in this survey was established through a review by a panel consisting of high school vocational agriculture teachers, secondary school administrators, secondary guidance counselors, and teacher educators. Results were noted and revisions were made based on the suggestions from this panel.

Data Collection

The final instrument was prepared and distributed by mail to the selected sample. Instruments distributed included sufficient students forms for all Vocational Agriculture III students (as indicated on participation return postcard).

Follow-up phone calls were made to all participants who had not returned the instruments within two weeks of the original mailing. Twenty-three of 30 schools and 366 students responded to the study. This gave a 77% return rate of the schools. Additional follow up would have been fruitless since school had ended.

RESULTS

Description of Respondents

Reasons For Enrollment

The majority of the students (194 or 53%) said they enrolled in vocational agriculture because they had an interest in an agricultural career. The next most frequently mentioned reason (49 or 13.4%) was that vocational agriculture was recommended by another student. Thirty-eight students (10.4%) said they enrolled because they liked the vocational agriculture teacher. Other reasons identified by students included: recommended by parent(s) (20 or 5.5%), no other electives available (17 or 4.6%), recommended by guidance counselor (8 or 2.2%), and recommended by teacher (5 or 1.3%).

In addition, 35 students (9.6%) indicated reasons in the "other" category. Some of these which were specified were: the course is fun, easy grade (credit), personally wanted to, interested in FFA, and like shop work.

Career Objective

Fifty-four students (14.7%) said they would pursue a career in a field of agriculture and 85 students (23.2%) said they were considering a career in a field of agriculture. Therefore, 139 students (37.9%) were at least interested in an agricultural career. In addition, 162 students (44.3%) said they were undecided on a career option, and 65 students (17.8%) indicated they were not interested in a career in the field of agriculture.

Father's Education

Regarding their father's education level, almost three-fourths (74%) of the students indicated that their fathers had attained a high school diploma or higher. There were 155 students (42.9%) indicating their father had a high school diploma. Ninety-three students (25.8%) said their father had less than a high school diploma. Fifty-four students (15%) said their father had attended vocational or business school or had completed some college work, and 37 students (10.2%) said their father had a college degree. There were 22 students (6.1%) saying they were uncertain or the question did not apply. Five students did not respond to the question.

Mother's Education

The majority of students (209 or 57.4%) indicated their mother had a high school diploma. There were 63 students (17.3%) who said their mother had less than a high school diploma, 46 students (12.6%) indicated their mother attended vocational or business school or had completed some college work, and 32 students (8.8%) said their mother had a college degree. Fourteen students (3.9%) said they were uncertain or the question did not apply, and two students did not respond to the question. Over three-fourths of the students (79%) indicated their mother had attained a high school diploma or higher.

FFA Membership

Number of years of FFA membership was requested of students. Over two-thirds (250 or 68.5%) of the students indicated they had been a member of the FFA for three years. Seventy-three students (20%) were a member for two years, 28 the students (7.7%) said they were a member for one year, and 14 students (3.8%) had never been a member of the FFA. One student did not respond to the question.

Occupational Plans/Counselor

Whether or not students discussed their occupational plans with the guidance counselor and the degree of help given are noted below. There were 199 students (54.8%) that had not discussed occupational plans with the counselor while 164 (45.2%) said they did. Three students did not respond to the question.

Of those students who had discussed their occupational plans with the guidance counselor, 108 (65.9%) said the counselor was helpful, 33 students (20.1%) said the counselor was very helpful, and 23 (14%) said that the counselor was not helpful.

Occupational Plans/Vocational Agriculture Teacher

There were 189 students (52%) saying they did discuss their occupational plans with their vocational agriculture teacher while 174 students (48%) said they did not. Three students did not respond to this question.

Of those students who had discussed their occupational plans with the vocational agriculture teacher, 119 students (63%) said that he was helpful, 56 students (29.6%) said he was very helpful, and 14 students (7.4%) said the vocational agriculture teacher was not helpful.

When Occupational Choice Was Made

Seventy percent of the students had made their occupational choice by the eleventh grade. There were 117 students (32.3%) who indicated that they made their choice in the eleventh grade, 69 students (19.1%) in the tenth grade, 42 students (11.6%) in the ninth grade, 25 students (6.9%) who made their choice in the eighth grade, and four students (1.1%) in the twelfth grade. A total of 105 students (29%) said no choice had been made. Four students did not respond to the question.

Educational Plans

When asked about their educational plans for the future, 137 students (37.7%) said they planned to complete high school, 118 students (32.5%) said they would attend vocational or business school or some college, and 101 students (27.8%) indicated they planned to obtain a college degree. Seven students (2%) indicated they planned to drop out of high school. Three students did not respond to this question. A total of 60.3% of the students in the study indicated completion of some higher formal education as their goal.

Influences on Educational and Occupational Choices

The influence of certain factors on the educational and occupational choices of students in Vocational Agriculture III were examined. Two specific areas were assessed and the findings are shown below.

Influential Persons Toward Occupational Choice

Responses to the ranking of the five most influential persons toward a student's occupational plans were observed and the results are shown in Table 1. The father and mother ranked highest with the first (mean rank=2.83) and second (mean rank=2.94) positions respectively.

Influential Persons Toward Educational Plans

Concerning their future education, students in the study indicated the people bearing the most influence toward their educational plans. Ratings and corresponding ranks are indicated in Table 1. The mother and father were ranked highest with mean ranks of 2.33 and 2.67 respectively.

Cross Classification of Selected Demographic Characteristics

Selected demographic characteristics and career factors were examined for independence using the chi-square analysis technique and the findings are presented in this section.

Educational Plans by Father's Education

The independence of the educational plans of the students and the fathers' education was examined and the significant chi-square revealed that the variables were not independent (x^2_9=33.07, $p < .05$). Thirty-seven students (10.9%) indicated their father had a college degree. Within this group, there is a tendency to have higher educational plans. Eighteen of these students (48.6%) planned a college degree, 11 students (29.7%) planned to attend vocational or business school or some college, and eight students (21.6%) planned to complete high school.

Ninety-two students' fathers had less than a high school diploma. Of these, 97.8% planned to complete high school and/or pursue further education. Only 15 students (16.3%) of this group planned to get a college degree.

Educational Plans by Mother's Education

Upon examination of the educational plans of the students and their mothers' educational level, a significant chi-square was found indicating that

Table 1

Student Opinion Regarding Influence of Specific Individuals on Occupational and Educational Choices

	Influence on Occupational Choice			Influence on Educational Choice		
Item	Mean[a] Rank	SD	Rank	Mean Rank	SD	Rank
Father	2.83	1.90	1	2.67	1.78	2
Mother	2.94	1.90	2	2.33	1.65	1
Friend	4.80	1.51	3	4.88	1.44	3
Brother or sister	5.01	1.57	4	5.02	1.46	5
Grandparent(s)	5.11	1.42	5	5.01	1.43	4
Vocational agriculture teacher	5.11	1.44	6	5.12	1.43	6
Person in the occupation	5.12	1.55	7	5.42	1.24	8
Other relative	5.25	1.33	8	5.23	1.28	7
Coach	5.69	0.94	9	5.78	0.75	11
Guidance counselor	5.70	0.82	10	5.65	0.88	9
Media	5.72	0.99	11	N/A		
Others	5.79	0.95	12	5.81	0.90	13
Academic teacher	5.79	0.79	13	5.74	0.88	10
Principal	5.84	0.62	14	5.81	0.67	12
Other vocational teacher(s)	5.96	0.33	15	5.98	0.24	15
Clergyman	5.98	0.23	16	5.94	0.45	14

[a] Mean rank was calculated as an average of the ranks assigned to each item. Any item not ranked among the top five was assigned a value of six.

the variables were not independent ($x^2_9=35.02$, $p<.05$). Of the students whose mother had either attended vocational or business school or some college (13.2%), or had a college degree (9.2%), a trend was shown to pursue a higher level of education. Within these two groups, a total of 37 students (47.4%) planned to pursue a college degree, 24 students (30.8%) planned to attend vocational or business school or some college, and 14 students (17.9%) planned to get a high school diploma.

There were 63 students reporting their mother's education to be less than a high school diploma, 26 students (41.3%) were to go to vocational or business school or some college, and nine students (14.3%) were planning to earn a college degree.

Reasons for Enrolling by Career Objective

A significant chi-square ($x^2_6=41.25$, $p<.05$) was found when examining the reasons students enrolled in vocational agriculture courses and their career objective. There were 232 students who indicated they were interested in an agricultural career. Of these, 118 (50.9%) said they were considering a career in or would pursue a career in an agriculturally related field.

Among other reasons for enrollment, there were much fewer who indicated intentions to pursue or interest in an agricultural career. Of 17 students (5.1%) who said they were enrolled because no other electives were available, 88.2% of them were either undecided on a career or definitely not interested in an agricultural career. In addition, of the 82 students who enrolled because the course was recommended to them, only 15 (18.3%) were at least considering a career in agriculture.

Career Objective by Occupational Discussion With Ag Teacher

The two variables of career objective and whether or not the students discussed their occupational choice with their vocational agriculture teacher were examined. The calculated chi-square was significant ($x^2_3=42.33$, $p<.05$).

There were 54 students (14.9%) who said they would pursue a career in agriculture. Over three-fourths (77.8%) of these students had discussed their occupational choice with their vocational agriculture teacher. Similar results were found with the students saying they would consider a career in agriculture. Of these 85 students (23.4%), more than two-thirds (70.6%) had discussed their occupational choice with their vocational agriculture teacher. The majority of students either pursuing or considering an agricultural career had discussed their plans with their vocational agriculture teacher.

A total of 161 students (44.4%) said they were undecided on a career. There were 59.6% of these who had not discussed occupational plans with their vocational agriculture teacher. Sixty-three students (17.4%) indicated they would not pursue a career in agriculture. Of these, 65.1% had not discussed their occupational choice with their vocational agriculture teacher. Of the students undecided on a career or not pursuing an agricultural career, the majority of them had not discussed their occupational choice with their vocational agriculture teacher.

CONCLUSIONS

Based on the findings of this study, the following conclusions were drawn by the researchers.

1. A majority of the vocational agriculture students in the study indicated that they had made an occupational choice by the eleventh grade.
2. The mother and father were rated as the two most influential people toward the vocational agriculture students' educational and occupational plans.
3. Vocational agriculture students whose parents have attained higher educational levels generally have higher educational aspirations.
4. A majority of the vocational agriculture students who discussed occupational plans with vocational agriculture teacher and guidance counselors said the discussions were helpful.
5. A majority of the students indicated they enrolled in vocational agriculture because they had an interest in an agricultural career.

RECOMMENDATIONS

The following recommendations are based on the findings and conclusions of this study.

1. Career counseling should be given increased emphasis by vocational agriculture teachers and guidance counselors. A large portion of students indicated that they had not discussed their educational and/or occupational plans with counselors or teachers. Those who had discussed these items with counselors and/or teachers said the discussions were helpful.

2. Career counseling activities should begin early in the student's secondary schooling. Seventy percent of the respondents indicated their occupational decision had been made by the eleventh grade. Therefore, counseling, especially in the area of career awareness, should begin by the junior high school level.

3. Future research in this area should include the agricultural experiences and background of the parents (especially fathers) as a variable of investigation.

4. Further research should be conducted to determine if students' educational decisions are being made at an earlier age as was found with occupational decisions in this study.

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Occupational Aspirations of Third Year Vocational Agriculture Students
A Critique

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The researchers have investigated a topic which is of importance to the profession. We should continue to inquire about the educational and occupational choices made by the adolescent. This study documents a variety of reasons for enrollment into a program. It further reminds us that students who are enrolled have a variety of career objectives. Further, there are a variety of plausible explanations for occupational aspirations of third year students.

STRENGTHS OF THE RESEARCH. I commend the researchers for using a quasi-replication technique building on the work of Eaddy (1968). Using appropriate content validation, the instrument was adopted for this study. Clearly focused objectives were framed and guided the research activities. With one exception, the findings appear to augment broadly accepted educational practice. The period when occupational choice was made appears to be much earlier than most other educational research has reported.

LIMITATIONS OF THE RESEARCH. The frame for the study include "...3,282 students enrolled in Vocational Agriculture III courses in Louisiana during the 1984-85 school year." The sample included "...twenty-three of 30 schools and 366 students (who) responded to the study." There is a possibility of significant sampling error using a one-shot intact group conducted at the end of the school year. This error may be minimized using an appropriate random sample with replacement and follow up from the population frame.

There are the usual limitations caused by forced response survey instruments. Perhaps some provisions for open-ended responses should have been provided. Too, a critical content validation by students recently enrolled in Vocational Agriculture III may improve the instrument.

The researchers did not tie the findings to Eaddy's work. Replicated research is more beneficial when it provides a synthesis and analysis of the findings to the baseline research.

SUMMARY. This research provided a review of variables which affect the educational and occupational aspirations of students. As professionals, we need to be aware of the diversity of variables which impinge on student's choice. Conclusion 1, "a majority of the vocational agriculture students in the study indicated that they had made an occupational choice by the eleventh grade" is not congruent with currently accepted career development theory. This discrepancy warrants further investigation to explain the finding. Perhaps vocational agriculture students are different in their career selection. I want to thank Dr. Burnett and Mr. Venable for identifying and researching this important concern.

PERCEIVED RETRAINING AND UPGRADING NEEDS OF MANAGERS IN FIVE SELECTED NORTH DAKOTA AGRIBUSINESS INDUSTRIES

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INTRODUCTION

Agriculture is the primary industry in North Dakota. The Census of Population for North Dakota (1980) identified 41,487 people 16 years of age and older as being employed in agriculture, forestry, and fisheries in the state. This represents 15.2% of the total work force in North Dakota. This, however, reflects only those individuals involved in the production phase of agriculture. Many more persons were employed in other agricultural careers such as sales and/or service, processing, marketing, and distribution of agricultural products. The market value of all agricultural products sold in 1982 was estimated to be $2,294,326,000, an increase of 28.6% from 1978 (North Dakota Census of Agriculture, 1982).

Since agriculture is such an important segment of the state's economy, it is essential that preparation for employment, as well as the associated retraining and upgrading, be a top priority of educational programs in the state. Wright (1983) stated that the rapid increase in technology of agriculture/agribusiness is also a factor demanding a corresponding increase in the training level of managers and employees. Accurate and timely information regarding agricultural employment in North Dakota becomes a key decision-making tool for planning and conducting educational programs to prepare workers for the major industry of the state.

In 1977, the Department of Agricultural Education at North Dakota State University, in conjunction with the Agricultural Experiment Station, began a project to determine manpower needs in North Dakota agriculture. The project was revised in 1984 (Priebe, 1984). Previous studies from this project have gathered considerable data. Brahee (1978) estimated and projected manpower needs from published data sources. Migler (1980), Rheault (1980), Clark (1982), and Schumacher (1984) collected data on agricultural manpower needs in eight agribusiness industries in the state. Maatz (1983) gathered data concerning professional public employees in agriculture in North Dakota.

The wide range of new and changing agricultural occupations that has resulted from the rapid change in technology made it necessary to maintain an accurate count of actual and anticipated employment opportunities in order to develop efficient and effective training programs. This study was a continuation of the manpower project and was concerned with the gathering of data to help meet the retraining and upgrading needs of agricultural workers in North Dakota.

Need for the Study

Census data identified more than 25,000 small businesses operating in North Dakota as reported by Kohns (1984). However, this count identified only the survivors. The Small Business Administration estimated that one of every five new businesses started will fail the first year, and only 50% of them will still be operating in five years. This high small business mortality rate is due to several reasons, but the biggest reason by far according to Kohns (1984) is poor management. Specific reasons attributed to poor management as described by Nelson & Leach (1981) include lack of planning, inadequate controls, poor accounting methods, inability to read and understand financial statements, and inability to locate expert advice when needed. The need for current and relevant adult education for managers is thus very evident.

PURPOSES AND OBJECTIVES

A major purpose of this study was to determine the importance or value of various management skills as they relate to the success of a manager. The other major purpose of this study was to determine areas where managers felt they needed the most assistance in improving their management skills. The data obtained should be useful in planning vocational education programs for secondary students, post-secondary students, and adults in North Dakota. Specific objectives of this study included:

1. To determine the importance of selected managerial competencies as perceived by the managers in five selected agricultural industries in North Dakota.

2. To compare the differences in perceived importance of selected management functions by managers according to the managers' ages, years of experience, level of education, time spent in the actual management phase of the business, and type of industry.

3. To determine the perceived current improvement needed in the selected managerial competencies by the managers of five selected agricultural industries in North Dakota.

4. To compare the differences in perceived current improvement needed in the selected management functions by managers according to the managers' ages, years of experience, level of education, time spent in the actual management phase of the business, and type of industry.

PROCEDURES

Population and Sample

The population for this survey included managers in the grain trade, farm implement, horticultural related, meat processing, and dairy processing industries in North Dakota. A random sample of 50 businesses was drawn from each selected industry.

Method of Data Gathering

A questionnaire was developed with the assistance of university faculty in economics and business programs and pilot tested prior to the first mailing. The first mailing began on April 10, 1985. Two additional mailings followed with the last mailing conducted on May 9, 1985. A telephone follow-up or mailing back of the entire questionnaire for completion were two methods used to verify and complete questionnaires. A total of 140 useable questionnaires were returned for a response rate of 56%. The implement industry had the highest response rate of 66%, and horticulture the lowest at 48%.

DATA ANALYSIS

Respondents provided background data concerning their ages, years of experience, level of education, time spent in actual managing of the business, and the type of industry. They rated 47 selected management competencies as to their degree of importance from essential to not important. They also indicated the need they perceived for improvement in each of the 47 skills. These were rated from extensive need for improvement to no need.

Means were calculated for the importance of each skill and for improvement needed. Skills were grouped into five management functions of planning, leading, organizing, controlling, and financial management. Mean scores reflecting importance and needed improvement were calculated for each management function.

Analysis of variance was utilized to determine any significant differences that existed among the respondents' perceptions of the importance and improvement needed in five major management functions at the .05 significance level. Variables used for the purpose of analysis were: type of industry, age of the manager, years of managerial experience, level of education attained, and time spent in the actual capacity of managing. Duncan's Multiple Range Test was used to determine where specific differences occurred for each significant F value.

RESULTS

Background Data

Two-thirds of the respondents were managers of businesses they partially or completely owned. The largest group of managers, slightly over 40%, had been employed in the management function of their businesses between 6 and 15 years. Similarly, the largest age group of managers was in the range of 35 to 44 years. It was determined that 51 respondents spent at least 60% or more of their time managing, while 22 individuals reported spending 20% or less of their time in the management function of their business.

Approximately 63% of the businesses had four or fewer full time employees. Only 13% of the firms employed more than 15 persons. The mean years of education varied from 12.8 years for the dairy processing group to 14.38 years for the horticulture industry. The overall mean was 13.24 years.

Only two managers of the 140 responding were enrolled in a management training program or course at the time the survey was conducted, and only 21 had been enrolled in a similar program in the previous five years. However, 86 individuals responded favorably to the possibility of participating in a management training program in the future, with 22 answering "yes" and 64 "maybe." Not knowing exactly what was included in the management training program may have caused managers to reply with a "no" to that particular question.

Perceived Importance of Management Skills

Respondents rated the importance of 47 selected management skills as essential-(4), important-(3), somewhat important-(2), or not important-(1). Mean scores were calculated for the entire group of managers for each skill and are shown in Table 1.

Table 1 - Order of Importance of the Management Skills

Management Skills	Code	Mean	# rated essential/ important	% rated essential/ important
1. Maintaining customer/human relations	L	3.68	129	97.0
2. Planning for profit	P	3.67	132	97.1
3. Making decisions	L	3.56	127	95.5
4. Controlling and managing inventory	C	3.53	124	94.7
5. Budgeting	F	3.42	120	93.0
6. Managing time	O	3.40	119	90.8
7. Developing a general business policy	P	3.38	117	87.3
8. Managing accounts receivable	F	3.37	112	86.2
9. Motivating employees	L	3.32	114	87.7
10. Analyzing financial status of entire business	F	3.29	107	83.6
11. Managing business for short/long range goals	P	3.28	119	88.8
12. Managing assets	C	3.28	107	82.3
13. Managing sales	C	3.24	114	87.7
14. Communicating job expectations to employees	L	3.19	105	82.0
15. Determining price	P	3.19	106	78.5
16. Managing growth or decline	P	3.15	110	82.1
17. Training employees	L	3.15	104	80.6
18. Purchasing	C	3.14	107	81.7
19. Managing the office	L	3.12	101	77.1
20. Monitoring overall business performance	C	3.11	105	81.4
21. Detecting employees' concerns	L	3.11	106	80.9
22. Managing accounts payable	F	3.11	101	77.1
23. Planning for employee safety	L	3.09	97	75.2
24. Analyzing market situations	P	3.04	103	76.9
25. Handling problem customers	C	3.03	99	75.0
26. Securing funds	F	3.01	95	73.6
27. Establishing business control standards	P	3.00	101	75.9
28. Handling problem employees	L	3.00	93	72.7
29. Advertising and promoting products	O	2.98	98	74.8
30. Evaluating employee performance	L	2.96	98	76.0
31. Managing & interpreting records & accounts	F	2.95	96	74.4
32. Planning for taxes	F	2.92	94	72.3
33. Maintaining labor relations	L	2.92	91	70.5
34. Identifying business legal needs	O	2.88	95	72.5
35. Making investment decisions	F	2.85	88	68.8
36. Determining product line	P	2.84	90	67.2
37. Promoting employee growth	L	2.80	88	66.2
38. Recruiting and/or securing staff	L	2.75	88	66.2
39. Identifying target markets	O	2.73	82	63.1
40. Planning for expansion or change in product line distribution	P	2.72	87	66.9
41. Managing/controlling payroll	F	2.64	68	54.0
42. Market segments (special consumer groups)	C	2.60	72	57.1
43. Adapting to computers	C	2.59	70	55.6
44. Maintaining security (shoplifting, pilfering)	C	2.56	65	51.6
45. Planning for insurance needs	P	2.54	71	53.0
46. Identifying transportation problems	O	2.50	73	55.7
47. Developing employee benefit package	F	2.42	61	49.2

SKILLS CODE:
P = Planning
L = Leading
O = Organizational
C = Controlling
F = Financial Management

The management skill most managers perceived to be of greatest importance to the success of their businesses was that of maintaining customer/human relations. Planning for profit closely followed. Nineteen of the 47 skills were rated as either important or essential by a minimum of 80% of the managers responding, and only one skill, developing employee benefit packages, was rated by fewer than 50% as being essential or important. It appears that managers perceive the listed skills to be important in maintaining a successful business operation.

Importance of Management Functions

Managers of the five industries rated the importance of the management functions with mean scores of 2.90 to 3.13. Each management function contains the scores for a group of the selected competencies as indicated by the code for Table 1. A mean score of 3.0 indicates a rating of important.

Table 2--Comparison of Perceived Importance by Industry *P<.05

Management Functions	Combined	Implement	Grain	Meat	Dairy	Hort.	F Value
Planning	3.08	2.97	3.12	3.28	2.84	3.23	3.54*
Leading	3.13	2.96	3.35	3.09	2.97	3.31	2.58*
Organizing	2.90	2.68	3.06	2.97	2.78	3.05	2.27
Controlling	3.01	2.94	3.18	3.13	2.88	2.95	1.49
Financial Management	3.00	2.88	3.11	3.19	2.91	2.92	1.14

Significant differences existed in the perceived importance of both the planning and leading functions of management when comparing the five agribusiness industries. The managers in the meat processing industry rated the planning function to be more important that did the managers in the implement and dairy processing industries. The dairy processing managers also ranked planning significantly lower than did managers in the meat processing, horticulture, and grain industries. The grain industry managers ranked the leading function significantly higher than did managers in the dairy processing and implement industries.

Table 3--Comparison of the Perceived Importance by Time Spent Managing *P<.05

Management Functions	0 - 40%	41 - 60%	61 - 100%	F Value
Planning	2.95	3.07	3.20	2.90
Leading	2.98	3.14	3.25	2.22
Organizing	2.69	2.93	3.07	4.99*
Controlling	2.84	3.01	3.16	3.85*
Financial Management	2.82	3.08	3.09	2.15

The importance of two management functions, organizing and controlling, were found to differ significantly among managers when they were compared according to the amount of time they spent in management tasks. Individuals responding as managing 61 to 100% of the time rated the organizing function significantly higher than those managing up to only 40% of the time. The same was found to be true when examining the function of controlling. No significant differences were found when comparing managers' perceptions of the importance of management functions by age, years of experience as a manager, or level of education. The tables describing these data are not shown in this report.

Improvement Needed by Managers in Selected Competencies

The managers rated each of the 47 skills for the level of improvement needed: extensive need-(4), moderate need-(3), limited need-(2), and no need-(1). Mean scores calculated for the total group are shown in Table 4.

Table 4--Improvement Need by Managers in Selected Competencies

Management skills	Code	Mean	# rated extensive/ moderate	% rated extensive/ moderate
1. Planning for profit	P	2.83	86	68.3
2. Managing for short and long range goals	P	2.66	74	59.7
3. Budgeting	F	2.58	68	56.7
4. Analyzing market situations	P	2.56	67	54.0
5. Motivating employees	L	2.55	61	51.3
7. Adapting to computers	C	2.48	61	50.4
8. Developing business policy	P	2.47	63	52.1
9. Managing time	O	2.45	62	51.7
10. Controlling and managing	C	2.45	63	51.6
11. Analyzing financial status of entire business	F	2.45	59	49.6
12. Monitoring overall business performance	C	2.43	61	50.0
13. Maintaining customer/human relations	L	2.43	57	47.5
14. Advertising/promoting products	O	2.41	64	52.9
15. Identifying business legal needs	O	2.41	61	50.4
16. Making decisions	L	2.40	60	50.0
17. Managing assets	C	2.40	60	49.2
18. Managing accounts receivable	F	2.40	55	45.8
19. Planning for expansion/change in product line distribution	P	2.37	59	48.0
20. Managing sales	C	2.35	55	45.8
21. Establishing business control standards	P	2.35	54	44.3
22. Communicating expectations to employees	L	2.31	49	41.5
23. Detecting areas of employee concern	L	2.28	49	41.2
24. Making investment decisions	F	2.27	47	39.5
25. Identifying target markets	O	2.25	50	41.0
26. Securing funds	F	2.24	49	40.8
27. Planning for taxes	F	2.24	46	38.7
28. Managing the office	L	2.24	46	38.7
29. Handling problem employees	L	2.24	40	33.6
30. Training employees	L	2.23	47	39.5
31. Managing & interpreting records/accounts	F	2.23	47	39.5
32. Determining price	P	2.21	49	39.5
33. Managing accounts payable	F	2.18	46	38.3
34. Evaluating employee performance	L	2.18	45	37.5
35. Handling problem customers	C	2.18	44	36.7
36. Purchasing	C	2.13	40	33.3
37. Maintaining labor relations	L	2.09	36	30.0
38. Planning for employee safety	L	2.09	34	28.8
39. Marketing segments (cutsomer groups)	C	2.07	37	31.6
40. Promoting employee growth	L	2.07	32	27.1
41. Identifying transportation problems	O	2.00	37	30.6
42. Determining product line	P	1.99	35	28.7
43. Recruiting and/or securing staff	L	1.93	30	25.4
44. Planning for insurance needs	P	1.92	35	28.5
45. Managing and controlling payroll	F	1.91	28	24.1
46. Developing employee benefit package	F	1.82	28	23.9
47. Maintaining security (shoplifting/pilfering)	C	1.78	19	15.8

SKILLS CODE:			
	P = Planning	O = Organizing	F = Financial Management
	L = Leading	C = Controlling	

Table 4 contains the 47 management skills in order of improvement needed as perceived by the managers. They indicated that their greatest needs for improvement were in the skills of planning for profit, managing the business for short and long range goals, and budgeting. Although the mean scores for many items appeared low, a minimum of one-third of the managers indicated either extensive or moderate need for improvement in 36 skills. Therefore, the mean scores should not cause one to underestimate the managers' need for improvement.

Improvement Needed in Management Functions

Mean scores were calculated for the total group to indicate the level of improvement needed in each of the management functions. Table 5 shows the planning function to be the area in which managers felt they needed the most improvement as illustrated by the mean score of 2.40. The leading and financial management phases of the business were determined to need the least improvement by the managers responding. These two areas each received mean scores of 2.23. These scores indicate the perception of a limited to moderate need for improvement.

Table 5--Comparison of the Perceived Improvement Needed by Industry *P<.05

Management Functions	Combined	Implement	Grain	Meat	Dairy	Hort.	F Value
Planning	2.40	2.33	2.53	2.56	2.27	2.32	1.01
Leading	2.23	2.25	2.53	2.19	2.04	2.16	2.00
Organizing	2.30	2.28	2.68	2.13	2.06	2.36	3.38*
Controlling	2.25	2.37	2.44	2.32	2.00	2.12	2.12
Financial Management	2.23	2.31	2.29	2.44	2.00	2.10	1.32

Table 6--Comparison of the Perceived Improvement Needed by Manager's Age *P<.05

Management Functions	44 or younger	45 or older	F Value
Planning	2.49	2.28	3.33
Leading	2.37	2.07	6.02*
Organizing	2.44	2.15	5.47*
Controlling	2.39	2.10	6.04*
Financial Management	2.37	2.04	6.13*

Table 7--Comparison of the Perceived Improvement Needed by Education Level*P<.05

Management Functions	12 years or less	More than 12 years	F Value
Planning	2.26	2.51	4.99*
Leading	2.08	2.38	6.43*
Organizing	2.19	2.42	3.54
Controlling	2.12	2.38	5.05*
Financial Management	2.08	2.35	4.24*

Comparison of the perceived improvement needed by respondents in the five management functions indicated significant differences among the variables of type of industry, age groups of managers, and education level of managers. Grain industry managers perceived a greater need for improvement in the organizing functions over managers in the meat and dairy processing industries. The younger managers, 44 years old or younger, had a greater perception of need for improvement in the leading, organizing, controlling, and financial management functions than did managers 45 or older. Managers who had received more than 12 years of formal education perceived a significantly greater need for improvement in the functions of planning, leading, controlling, and financial management than those with 12 or fewer years of education. There were no significant differences when comparing by years of experience or time spent in managing.

CONCLUSIONS

The following conclusions were formulated from the results of the study:

1. A majority of the management skills included on the survey were perceived by managers as essential or important to the success of their operation. This group of skills could be used as a basis for planning a curriculum for an agribusiness management training program.
2. A considerable desire for a need for improvement in the management skills was expressed by at least one-third of the managers responding. This indicates a need for mangement education programs.
3. Although significant differences were found to exist among some variables, these differences, particularly in rating the importance of each function, appeared to be small enough to enable managers from all five industries to enroll in one common management training program.

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PERCEPTIONS OF 4-H LEADER QUALIFICATIONS

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INTRODUCTION

One of the greatest challenges facing the extension service today is providing adequate training for volunteer leaders. Volunteer leaders are the backbone of a successful 4-H program. Leaders need to know what is expected of them if they are to fulfill their leadership roles efficiently. The more leaders understand their leadership roles, the more effective their work will be and the greater the satisfaction they will receive from it.

The majority of extension staff members, at all levels, feel that the success of 4-H clubs in local communities depends to a large extent on the abilities of the volunteer leader. It is the responsibility of the extension staff to see that volunteer leaders receive adequate training to fit them for their leadership roles.

If such a training program is to be most effective, reliable information is needed concerning the volunteer leader's knowledge of leader responsibilities and training needs. If some of the volunteer leader's knowledge can be determined and the training needs of the volunteer 4-H leader identified, it would be helpful to the extension staff working with the volunteer leaders.

A study of the 4-H organizational leadership development process in Tennessee conducted by Billings et al. (1) in 1972 identified areas in which volunteer leaders desired more training. Volunteer 4-H leaders cited five areas where they felt more training was needed. The areas cited by these leaders were: 1) understand the philosophy, history, and objectives of 4-H work; 2) understanding and working with boys and girls; 3) conducting effective 4-H programs and meetings; 4) planning 4-H programs; and 5) effective demonstrations.

Billings et al. concluded that (1, p. 19):

> More detailed attention should be given to training in order to develop the volunteer 4-H leaders. Leadership development is a continuous process whereby leadership is improved and maintained.

Treat et al. (3), in 1975, through the use of the Delphi technique, studied 37 North Carolina people from all levels of the extension administration, 4-H volunteers, and other educators. They identified the incentives needed by 4-H volunteers to become leaders. They found that volunteer 4-H leaders who worked with young people possessed a positive self-concept and the ability to relate to children, parents, and other leaders. Volunteer leaders should have a regard for the basic worth of each individual as a human being. They further observed that leaders needed to understand the varying philosophies of youth, parents, and other leaders because a high priority existed to fulfill the personal development of each individual person.

Treat et al. concluded that an effective volunteer leader should (3, pp. 4-5):

> . . . understand needs of youth, developmental stages, and behavior of youth . . . have skill in communicating and interacting with youth, parents and other leaders . . . contribute directly to the growth and development of individual self-concept.

The review of literature pointed out that volunteers are important in maintaining the quality and quantity of existing 4-H programs. Training programs that are effective will provide the volunteer leader with the competencies they need to be effective leaders. Training for volunteer 4-H leaders may need to be conducted on both an individual and group basis and may be either formal or informal.

PURPOSE AND OBJECTIVES

The major purpose of this study was to determine the qualifications of volunteer 4-H leaders. More specifically, the study was designed to 1) identify the perceptions of volunteer 4-H leaders about the qualifications needed by 4-H leaders, 2) determine factors that influenced 4-H leaders to become involved in 4-H work as a leader, 3) compare the various characteristics that volunteer leaders possess and how they relate to their perceptions of the 4-H leader roles, and 4) determine the training needs of volunteer adult leaders.

PROCEDURE

Two hundred volunteer 4-H leaders from nine central Iowa counties were surveyed to discover their background and training needs. A random sample representing 32.9 percent (N=240) of the organizational, project, and program leaders was selected to participate in this study. Additional leaders were selected as substitutes. Counties having fewer than 12 project and program leaders required the selection of all leaders in the area affected to make the study more meaningful.

The cooperation of the State 4-H Office was secured to help with the collection of data. A cover letter and survey instrument were sent to 240 volunteer leaders and to the 69 leaders chosen as substitutes.

One hundred forty-five responses (60.4%) were received from the selected sample, and 43 responses (62.3%) were received from the substitutes. The substitutes were used to fill in the sample for those in the sample who had not responded. A ten percent sample of the non-respondents was selected for a follow-up telephone survey. After completion of the telephone survey, another 12 responses were added to the sample. A total of 200 responses (83.3%) comprised the final response and the response rate for the study.

ANALYSIS OF DATA

A reliability test of the instrument using Cronbach's procedure resulted in an overall alpha of .83 and a standardized alpha of .85. The data were analyzed using the following statistical treatments: 1) frequencies, percentages, and means; 2) single classification of analysis of variance (ANOVA); 3) t-test; and 4) post-hoc tests for differences.

Five-point Likert scales were used by respondents to rate qualifications considered to be important to 4-H leaders in order to perform their duties and possible factors that led them to become a 4-H leader. A numerical ranking was used to indicate preference for training methods.

One section of the questionnaire allowed respondents to indicate their response by checking equipment they had access to, barriers that prohibited them from participating in training meetings, and training schedule preferences. Another section of the questionnaire asked for specific information about number of miles they were willing to travel for training, number of meetings they could attend, and demographic information.

RESULTS

Based on data received in this survey, a profile of the average leader was developed. Leaders were generally women, 36 to 40 years old, with four to six years of past 4-H membership, with children involved in the program, and with an average of 14 years of education. Leaders provided leadership to clubs with an average of three leaders per club. Leaders were willing to drive an average of 25.6 miles one way to receive training and would attend three training meetings per year. Fifty-five percent of the leaders in the survey cited working at a job as the barrier most frequently preventing them from participating in leader training.

Leaders expressed a strong desire to understand their duties as a leader. They were interested in becoming more effective in fulfilling their leadership role as a 4-H leader. They also indicated methods they preferred to receive training information--group meetings, hands-on workshops, newsletters, bulletins, personal visits, and video tape.

Leaders indicated the need for up-to-date, practical material. They especially desired materials on: 1) understanding their duties as a leader; 2) understanding the characteristics of youth--their needs and interests; 3) obtaining and keeping parent cooperation; 4) understanding record keeping; and 5) knowing how to plan and organize their work.

Several observations were made when determining the influence that various factors had on respondents becoming 4-H leaders. Seven factors were compared with eight different groupings of the respondents. No overall means were found to be significantly different, although some group means for individual factors were found to be significantly different.

The results of the participants' responses to items pertaining to factors that influenced respondents to become a 4-H leader are contained in Table 1. The overall mean for factors that influenced respondents to become 4-H leaders was 2.96. It was observed that factors indirectly related to the 4-H program had little or no influence on respondents decision to become 4-H leaders. The factors that were most influential were "knowing that 4-H is important" and "knowing the 4-H program is needed," while "having spare time to occupy" had the least amount of influence.

Table 1. Means and standard deviations for factors that influenced respondents to become 4-H leaders

Factor	Mean	Standard Deviation
	N=200	
Knowing that 4-H is important	3.83	.96
Knowing the 4-H program is needed	3.83	1.05
Your children desiring to be in 4-H	3.53	1.44
Your interest and knowledge of 4-H project subject matter	3.23	1.11
Needing to participate as a good citizen	2.67	1.14
Camaraderie with other leaders	2.07	1.10
Having spare time to occupy	1.55	.91
Overall mean	2.96	1.10

Several observations were made when analyzing the perceptions of respondents about the qualifications needed by 4-H leaders. The leader qualification items and the participants' responses to these items are described in Table 2. Of the 15 leader qualifications studied, the four

Table 2. Means and standard deviations for the importance of specific qualifications necessary for persons to perform their duties as club leaders

Qualification	Mean	Standard Deviation
	N=200	
Understand your duties as a leader	4.36	.69
Understand the characteristics of youth--their needs and interests	4.27	.66
Obtain and keep parent cooperation	4.21	.70
Know what materials are available	4.13	.71
Understand 4-H record keeping	4.07	.87
Know how to plan and organize your work	4.03	.80
Know other forms of recognition for members besides awards	3.88	.86
Obtain information on specific project work and requirements	3.85	.84
Plan the local club program	3.79	.85
Understand the objectives and philosophy of 4-H	3.78	.83
Understand how to help 4-H members deal with stress	3.70	.91
Know how to prepare and display exhibits	3.70	.87
Help members select projects	3.49	.80
Prepare 4-H demonstrations/presentations	3.31	.90
Give 4-H demonstrations/presentations	3.24	.98
Overall mean	3.85	.82

most important qualifications as expressed by respondents were: "understanding the duties of a leader" (Mean=4.36), "understanding the characteristics of youth--their needs and interests" (Mean=4.27), "obtaining and keeping parent cooperation" (Mean=4.21), and "knowing what materials are available" (Mean=4.31). The three least important leader qualifications as expressed by the respondents were: "giving 4-H demonstrations/presentations" (Mean=3.24), "preparing 4-H demonstrations/presentations" (Mean=3.31), and "helping members select projects" (Mean=3.49).

The overall mean importance for qualifications necessary for persons to perform their duties as club leaders was 3.85 (above average) with a range from 3.24 to 4.36. The overall mean for factors that influenced respondents to become 4-H leaders was 2.96 (below average) with a range from 1.55 to 3.83.

CONCLUSIONS AND RECOMMENDATIONS

Specific leader qualifications will vary according to the knowledge, skill, understanding, and desire of individual leaders. The broad scope of the 4-H club program requires that leaders know what is expected of them. The most basic leader qualification is that of helping leaders determine their needs--helping them realize what their job is, how it should be done, and what is involved in doing it. This study suggests that leaders placed much importance on being well organized. The better the leaders understand their duties, the more effective their work and the greater the impact their program will have on their members.

The above observation reflects what Havens (2) concluded from his study. He noted that training equips the volunteer leader to function most effectively in his/her role as a leader. Weaver (4) related in his study that training received by volunteer leaders gave them a sense of direction and allowed them to become more effective in their leadership roles.

It is evident from both this study and literature that specific content of leader training should be structured to the needs of individuals receiving it. Training leaders receive should be well planned, follow a logical sequence, provide an opportunity to learn by doing, and create an interest for more training. Successful and effective leader training will provide the volunteer leader with a sense of purpose, an understanding of the 4-H members, ways to obtain and keep parent cooperation, the principles of organization, and a knowledge of what is expected of them as a leader.

When looking at 4-H leaders as a group, it was observed that the leader qualifications most urgently needed were: 1) understanding the duties of a leader; 2) obtaining and keeping parent cooperation; 3) understanding the characteristics of youth--their needs and interests; 4) knowing what materials are available; and 5) knowing how to plan and organize work.

Leader training should be offered during the evening hours. Short sessions should be utilized covering one subject per session. Leader training information should be made available on audio cassette tape or video tape for those leaders who have conflicts and cannot attend scheduled training meetings or for leaders seeking additional information to help them in their leadership roles. Leaders need to be better informed when training is to take place so all will have the opportunity to participate.

Today's leaders are busy individuals, and this requires them to be well organized so their time and energies are utilized effectively. Subject matter training is very essential for leaders to be competent in their leadership roles. Leader training meetings are one of the most effective methods of providing education for the 4-H leader, but with today's demands, alternative methods may need to be utilized so training information will reach more leaders.

It's important to determine how county staff members are disseminating information on leader training. Of those who didn't participate in training, nine percent were not aware of existing training opportunities. This study could aid in the development of a means by which leaders are made aware of training developed for their benefit.

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Perception of 4-H Qualifications

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The study of 4-H leader qualifications is very important to Cooperative Extension. The main purpose was to determine the qualifications needed by volunteer 4-H leaders. The study of a leader's self-perception is of value but does not address the entire question of training and qualifications. It is like having a class pick the subjects they wish to study in an area in which they have no background or experience in. This is the spot where the teacher/extension agent must also have input. They have the additional training and preparation to recommend areas where training is needed. Often the expertise must come from the university specialists to determine the new training needs that are developing. Therefore the results of this study answer only part of the question posed. In some situations the clientele group (recipients) could be considered the appropriate evaluators of leader qualifications. However in the case of 4-H this would not be appropriate.

The researcher received a reasonable response from the sample and is to be commended for the follow-up procedures utilized for data collection. The instrument developed had reasonable reliability. The descriptive statistics utilized for the analysis were appropriate.

The findings of the study were as might be expected from previous investigations. The findings might be useful for agents to identify potential 4-H leaders. Many of the most useful findings were in addition to the original objectives to the study. The entire area of 4-H leader training and qualifications merits further study in greater depth.

PERCEPTIONS OF YOUNG FARM MEN AND YOUNG FARM WOMEN TOWARD WOMEN IN NONTRADITIONAL AGRICULTURAL WORK ROLES

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INTRODUCTION

Nontraditional career areas for women are those that have less than 30% women workers (2). Agriculture is one of these career areas. Swoboda (4) found that the greatest movement of women into nontraditional careers was in the areas of business and management, followed by agriculture. In recent years, the College of Agriculture at Iowa State University has experienced a large increase in the percent of women pursuing an agricultural degree. In 1970 there were 652 male graduates and 11 female graduates (1.7 percent) from the College of Agriculture. In 1983, the number of male graduates had decreased to 486 graduates, and the number of female graduates had increased to 151 (27.3 percent) (1).

A review of recent women employment trends in agriculture in Iowa revealed that 5 percent of those employed in the area of extension agriculturalist/county extension director were women. In agribusiness positions, the percent of women employed was less than 15 percent (3). In 1970, there were 2757 thousand men and 277 thousand women in the United States engaged in agricultural careers. In 1980, 2581 thousand men and 451 thousand women were engaged in agricultural careers (5). It is apparent that an increasing number of women is becoming interested in this nontraditional field of work.

Women working in this nontraditional area will be working with a variety of clientele. One clientele group will be Iowa young farm men and women.

PURPOSE AND OBJECTIVES

This study was conducted to determine the attitudes and perceptions of young farm men and young farm women in Iowa toward women employed in nontraditional agricultural work roles.

Specifically, the objectives were to:

1. Determine the attitudes and perceptions of young farm men and women towards women in agricultural work roles.
2. Determine the attitudes and perceptions of young farm men and women toward women as effective workers in agriculture.

PROCEDURE

A descriptive design was used for this study. A questionnaire was used to collect data to satisfy the study objectives. Members of the Iowa Young Farmer Association and their wives were the population studied.

Twenty-two statements which identified specific agricultural work roles, six statements which identified specific traditional work roles for women, and thirty statements which described the effectiveness of women in agricultural work roles were developed by the researcher. The questionnaire also included nine items which sought demographic information about each of the respondents. These items included information about age, sex, income level, education level, and the level of contact the respondents had had with women in specific agricultural work roles.

One hundred men and 100 women were randomly selected from the Iowa Young Farmer roster. Of the 200 questionnaires mailed, a total of 152 (76 percent) of the respondents returned the completed usable questionnaires.

The scale used in this research was developed by Warren (6) to measure attitudes. The scale contained an "agree" or a "disagree" option with one to five points for each option. No opinion was expressed by circling both agree and disagree, and leaving the level blank.

ANALYSIS OF DATA

Analysis of the data included: frequencies, percentages, and means. The reliability coefficient for the first section of the questionnaire, which measured the attitudes of young farm men and women towards women in agricultural work roles, was .90. The reliability for the last section of the questionnaire, which measured perceptions of the effectiveness of women employed in agricultural work roles, was .79. Because of the high alpha values, the 28 items measuring attitude and the 30 items measuring effectiveness were collapsed and treated as one overall attitude score and one overall effectiveness score.

RESULTS

Equal numbers of men and women responded to the survey instrument (N=76 in each group). It was observed that the mean age of respondents was 34.7 years. All respondents had attended some high school, with most respondents having a high school diploma and some post-secondary schooling. Over ninety percent (90.8 and 90.1, respectively) were married and lived on a farm.

Only three of the 152 respondents had had no contact with women in agricultural work roles. The mean number of contacts was 4.9. It was further observed that 54 percent of the respondents had had from three to five contacts with women in agricultural work roles and that 13.2 percent of the respondents had had six or more such contacts.

It was observed that 89.8 percent of the respondents agreed at the 3.7 (much agreement) level that women should be employed in the 28 work roles listed. At the 2.4 (little disagreement) level of disagreement, 7.1 percent felt that women should not be employed in these work roles. Approximately three percent of the respondents had no opinion. The work roles the respondents were in most agreement with were: (1) animal nutritionist (97.4 percent agreement at the 3.8 level); (2) county fair planner (96.7 percent agreement at the 3.9 level); (3) milk tester for a dairy company (94.7 percent agreement at the 3.9 level); and (4) USDA Meat Inspector (92.1 percent agreement at the 3.6 level of agreement). The work roles the respondents were in least agreement with were: (1) teacher of farm mechanics (67.8 percent agreement at the 2.9 level); (2) farm machinery manager (68.4 percent agreement at the 3.1 level); (3) vocational agriculture teacher (78.3 percent at the 3.3 level); and (4) cattle salesperson (79.6 percent agreement at the 3.2 level).

Six of the questions listed in the first section of the questionnaire measured the respondents' attitudes towards women in traditionally female work roles. Ninety-seven percent of the respondents agreed that women should be employed in these work roles. The work roles considered traditional to women were: home economist, bookkeeper, social worker, nurse, fashion designer and secretary. When analyzing the data after these work roles were removed, it was observed that 87.5 percent of the respondents agreed at the 3.6 (much agreement) level, 8.6 percent disagreed at the 2.7 (little disagreement) level and 3.4 percent expressed no opinion about women being employed in the remaining 22 agricultural work roles.

Table 1. Attitudes of young farm men and women towards women working in nontraditional agricultural work roles

Work role		Number	Percent	Mean
		N=152		
Extension Home Economist	Agree	150	98.6	4.3
	Disagree	1	.7	2.0
	No opinion	1	.7	
Bookkeeper/ Secretary	Agree	148	97.4	4.4
	Disagree	1	.7	2.3
	No opinion	3	2.0	
County Extension Agriculturalist	Agree	137	90.1	3.5
	Disagree	10	6.6	2.4
	No opinion	5	3.3	
Veterinarian	Agree	138	90.8	3.6
	Disagree	12	7.9	2.8
	No opinion	2	1.3	
Bank Officer	Agree	134	88.2	3.6
	Disagree	10	6.5	2.3
	No opinion	8	5.3	
Social Worker	Agree	148	97.3	4.1
	Disagree	1	.7	2.0
	No opinion	3	2.0	
Milk Tester for Dairy Company	Agree	144	94.7	3.9
	Disagree	1	.7	1.0
	No opinion	7	4.6	
Governmental Agricultural Position	Agree	138	90.8	3.6
	Disagree	8	5.3	3.3
	No opinion	6	3.9	
County Fair Planners	Agree	147	96.7	3.9
	Disagree	2	1.3	3.0
	No opinion	3	2.0	

Meat Carcass Graders	Agree	136	89.5	3.7
	Disagree	9	6.0	2.5
	No opinion	7	4.5	
Nurse at an Elementary School	Agree	150	98.7	4.5
	Disagree	0		
	No opinion	2	1.3	
Artificial Insemination of Farm Animals	Agree	132	86.8	3.6
	Disagree	14	9.2	3.4
	No Opinion	6	3.9	
Agronomist	Agree	138	90.8	3.7
	Disagree	6	3.9	2.7
	No opinion	8	5.3	
Animal Nutritionist	Agree	148	97.4	3.8
	Disagree	1	.7	5.0
	No opinion	3	2.0	
Soil Conservationist	Agree	140	91.4	3.7
	Disagree	9	5.9	2.9
	No opinion	3	2.6	
Vocational Agriculture Teacher	Agree	119	78.3	3.3
	Disagree	30	19.7	2.3
	No opinion	3	2.0	
Cattle Salesperson	Agree	121	79.6	3.2
	Disagree	25	16.4	2.5
	No opinion	6	3.9	
USDA Meat Inspector	Agree	140	92.1	3.6
	Disagree	8	5.3	2.9
	No opinion	4	2.6	
Fashion Designer	Agree	150	98.7	4.2
	Disagree	0		
	No opinion	2	1.3	
Feed Salesperson	Agree	127	83.6	3.3
	Disagree	18	11.8	2.7
	No opinion	7	4.6	
Quality Control at a Meat Processing Plant	Agree	145	95.4	3.7
	Disagree	3	2.0	3.0
	No opinion	4	2.6	
County Extension Director	Agree	136	89.5	3.6
	Disagree	11	7.2	3.0
	No opinion	5	3.3	
Farm Machinery Manager	Agree	104	68.4	3.1
	Disagree	40	26.3	2.6
	No opinion	8	5.3	
Teacher of Farm Mechanics	Agree	103	67.8	2.9
	Disagree	44	28.9	2.8
	No opinion	5	3.3	

Agriculturalist in a Developing Country	Agree	128	84.2	3.2
	Disagree	17	11.2	3.8
	No opinion	7	4.6	
Secretary in a Law Office	Agree	150	98.0	4.2
	Disagree	0		
	No opinion	2	2.0	
Leadership Position in Agriculture	Agree	134	88.2	3.6
	Disagree	12	7.9	2.3
	No opinion	6	3.9	
Farrowing Manager at a Hog Farm	Agree	139	91.5	3.9
	Disagree	9	5.9	3.0
	No opinion	4	2.6	
TOTAL	Agree	136	89.8	3.7
	Disagree	11	7.1	2.4
	No opinion	5	3.1	

An analysis of the participants' responses by specific work roles revealed that 90 percent or more of the respondents agreed that women should be employed in 17 work roles; between 80 and 90 percent agreed that they should be employed in seven work roles; between 70 and 80 percent agreed that they should be employed in two work roles; and between 60 and 70 percent agreed that women should be employed in two work roles.

It was observed that, of the total effectiveness qualities studied, 84.5 percent of the respondents agreed at the 3.7 (much agreement) level, whereas 6.7 percent disagreed at the 2.8 (little disagreement) level and 8.8 percent expressed no opinion about the effectiveness of women employed in these work roles. The effectiveness areas the respondents were in most agreement with were: (1) women's ability to be knowledgeable in the area of agriculture (100 percent agreement at the 4.3 level of agreement); (2) women being adept in the knowledge of nutrition (100 percent agreement at the 4.2 level); (3) women's ability to be knowledgeable of technical agricultural areas (99.3 percent agreement); and (4) women extension workers as resource persons (99.3 percent agreement). The areas indicated by the respondents where women were least effective were: (1) women working at jobs where they can be involved in farming (31.6 percent agreement at the 2.9 level); (2) women being accepted by their students in teaching vocational agriculture (52.6 percent agreement at the 2.8 level); and (3) women having the physical strength needed for farm work (61.8 percent at the 2.7 level).

Table 2. Perceptions of young farm men and women about the effectiveness of women employed in nontraditional agricultural work roles

Work role effectiveness		Number	Percent	Mean
		N=152		
Women work best at jobs where they can be involved in farming.	Agree	48	31.6	2.9
	Disagree	68	44.7	2.7
	No opinion	36	23.7	

Women can be knowledgeable in the area of agriculture.	Agree	152	100.0	4.3
	Disagree	0		
	No opinion	0		
Women can be effective promoters of extension programs.	Agree	150	98.6	4.2
	Disagree	1	.7	1.0
	No opinion	1	.7	
Women in agricultural positions can be knowledgeable of the technical information in their area.	Agree	151	99.3	4.0
	Disagree	1	.7	3.0
	No opinion	0		
Women veterinarians are capable of working with farm animals.	Agree	141	92.8	3.8
	Disagree	9	5.9	2.9
	No opinion	2	1.3	
Women can be good managers.	Agree	150	98.6	4.6
	Disagree	1	.7	3.0
	No opinion	1	.7	
Women extension workers can be good resource persons.	Agree	151	99.3	4.2
	Disagree	0		
	No opinion	1	.7	
Women veterinarians are good evaluators of animal illness.	Agree	128	84.2	3.9
	Disagree	1	.7	3.0
	No opinion	23	15.1	
Women agribusiness salespersons have good working relationships with their clientele.	Agree	122	80.3	3.4
	Disagree	6	3.9	1.7
	No opinion	24	15.8	
Women can be fair evaluators of extension programs.	Agree	141	92.7	3.9
	Disagree	3	2.0	2.7
	No opinion	8	5.3	
Women are well accepted by their students in teaching vocational agriculture.	Agree	80	52.6	2.8
	Disagree	24	15.8	2.2
	No opinion	48	31.6	
Women have good math ability and work well in the banking industry.	Agree	134	88.1	3.8
	Disagree	5	3.2	2.2
	No opinion	13	8.7	
Women can be capable in communicating with farmers in agricultural related fields.	Agree	137	90.1	3.6
	Disagree	7	4.6	2.0
	No opinion	8	5.3	
Women can be effective workers in hog operations.	Agree	144	94.7	4.1
	Disagree	5	3.3	1.8
	No opinion	3	2.0	
Women possess good leadership skills needed in government agricultural positions.	Agree	128	84.2	3.4
	Disagree	8	5.3	2.5
	No opinion	16	10.5	
Women can be effective carcass graders.	Agree	137	90.2	3.8
	Disagree	4	2.6	3.0
	No opinion	11	7.2	

Women can be good administrators.	Agree	145	95.4	3.9
	Disagree	2	1.4	2.5
	No opinion	5	3.2	
Women working as agronomist can be good public relations persons.	Agree	133	87.5	4.1
	Disagree	3	2.0	2.3
	No opinion	16	10.5	
Women have good office skills when working as county extension directors.	Agree	131	86.1	3.8
	Disagree	2	1.4	2.0
	No opinion	19	12.5	
Women are good high school vocational agriculture teachers.	Agree	92	60.5	3.1
	Disagree	19	12.5	2.3
	No opinion	41	27.0	
Women are good at adapting to different cultures, and would be capable of working in developing countries in agriculture.	Agree	114	75.0	3.4
	Disagree	17	11.2	2.5
	No opinion	21	13.8	
Women can be very adaptive to new ideas.	Agree	143	94.1	3.3
	Disagree	3	2.0	3.0
	No opinion	6	3.9	
Women are well respected in the selling of agricultural products.	Agree	94	61.8	2.3
	Disagree	33	21.8	2.2
	No opinion	25	16.4	
Women can be effective planners of educational programs.	Agree	148	97.4	4.0
	Disagree	0		
	No opinion	4	2.6	
Women can be adept in the knowledge of nutrition.	Agree	152	100.0	4.2
	Disagree	0		
	No opinion	0		
Women work well with, and can be sympathetic to all types of people.	Agree	135	88.8	3.8
	Disagree	8	5.3	1.7
	No opinion	9	5.9	
Women can be good decision makers.	Agree	141	92.8	3.9
	Disagree	5	3.3	1.4
	No opinion	6	3.9	
Women have self-confidence in their work roles.	Agree	136	89.5	3.6
	Disagree	6	3.9	2.0
	No opinion	10	6.6	
Women are good insurance salespersons due to their ability to communicate insurance options.	Agree	101	66.4	3.2
	Disagree	16	10.5	2.5
	No opinion	35	23.1	
Women have the physical strength needed for farm work.	Agree	94	61.8	2.7
	Disagree	49	32.3	2.9
	No opinion	9	5.9	
TOTAL	Agree	128	84.5	3.7
	Disagree	10	6.7	2.8
	No opinion	14	8.8	

CONCLUSIONS AND/OR RECOMMENDATIONS

There was little opposition among Iowa young farmers toward women working alongside men in agricultural work roles. Vocational agriculture teachers in this state should be aware of this fact and not discourage women enrollment in any aspect of their classes.

Women seeking employment in an agricultural career need not be hesitant of bias that may exist in Iowa among this group. If such bias exists, it is not significant and should not be a barrier to successful employment.

The young farmer group studied made many comments supporting women in pursuing any career they choose as long as they had the proper training, be it a "traditional" or a "nontraditional" work role.

Additional research could be conducted on other groups in Iowa to determine if their attitudes and perceptions toward women in nontraditional agricultural work roles are similar to those observed in this study.

Other nontraditional career areas could be researched to see if sex segregation of occupations is changing in other than agricultural occupations.

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Perceptions of Young Farm Men and Young Farm Women Toward Women in Non-Traditional Agricultural Work Roles
A Critique

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The purpose of this study, as the title implies, was to determine the attitudes and perceptions of young farm men and young farm women in Iowa toward women employed in non-traditional agricultural work roles. The author is to be commended for researching a topic of obvious interest to her and others preparing people for employment in agricultural occupations. Two findings of particular interest to those of us in teacher education or supervision are: 1) The work roles the respondents were in least agreement with included a teacher of farm mechanics and vocational agriculture teacher; and 2) an area indicated by respondents where women were least effective was "women being accepted by their students in teaching vocational agriculture."

Strengths

1. The introduction is concise yet logically developed to provide a theoretical basis for the development of the research problem.
2. The purpose and objectives have been clearly stated.
3. The author used appropriate measures to determine the reliability of the questionnaire.
4. Descriptive statistics were used which were appropriate for this study.
5. The results were presented in a clear, concise manner with the use of detailed tables and accompanying narrative.

Weaknesses

Weaknesses found in the study perhaps resulted from restrictions on the number of pages allowed in the report. The author used slightly over four pages to present two tables and, perhaps, slighted other sections of the report. Some weaknesses found were:

1. Documentation in the report was inconsistent with procedures normally followed. If the paper were to be submitted to The Journal of the AATEA, documentation should follow the APA style.
2. The procedure section of the report was rather brief, leaving cause to raise the following questions:
   a. Was the questionnaire tested for content validity? If so, who was your test group?
   b. Were follow-up procedures used in an effort to increase your response rate? If not, how were non-respondents treated? How generalizable were the results of the study?
3. It was difficult to conceptualize the scale used to measure attitudes. I had to read that section of the report several times to somewhat understand. I would suggest providing an example of a question or a clearer explanation of the scale.
4. The "TOTAL" portion in each of your tables is unclear. What does each total represent?

In conclusion, I think the researcher has conducted an interesting study resulting in some interesting findings. However, one might ask the question: So what? How might the information gleaned from this study be used in Iowa and other states?

PERCEPTIONS OF VOCATIONAL AGRICULTURE SUBJECT MATTER AREAS

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INTRODUCTION

An important factor for teacher educators to consider when selecting a school and supervising teacher to be used for student teaching is the local vocational agriculture curriculum. How that curriculum is perceived by secondary vocational agriculture students, the vocational agriculture teacher, and the school administrator may influence how the practicing student teacher views the curriculum, and in turn, the quality of student teaching experience he or she has received in that school.

It would seem reasonable that the closer the perceptions of the secondary vocational agriculture student, the agriculture teacher and the school administrator concerning the content of the local vocational agriculture curriculum, the more accurate would be the student teacher's understanding of the curriculum being offered by the school.

A review of current literature in the ERIC system failed to locate studies which have researched either how secondary vocational agriculture students, secondary vocational agriculture teachers, and school administrators perceive the local vocational agriculture curriculum or if there was a difference in how these three groups perceived the local vocational agriculture curriculum offerings.

PURPOSE AND OBJECTIVE

The problem in this study was to determine the extent of agreement among school administrators (superintendents) vocational agriculture teachers, and senior secondary vocational agriculture students concerning the emphasis placed on thirty-two agriculture/agribusiness subject matter areas in the vocational agriculture curriculum.

PROCEDURES

Population and Sample

A random sample of 48 or 35 percent of the secondary vocational agriculture teachers was drawn from a list of the 1985 Nebraska secondary vocational agriculture teachers.

Instrumentation

A questionnaire was developed which listed 32 agriculture\agribusiness subject matter areas, based on the Nebraska Vocational Agriculture Core Curriculum. The list of content areas was validated through a jury review including two Teacher Educators, two State Department of Education Vocational Agriculture Consultants, and four vocational agriculture teachers not in the sample.

Data Collection

The questionnaires were mailed to the 48 agriculture teachers. Each teacher was asked to have their school administrator (superintendent) and senior students complete the form, and the teacher was to complete a copy.

The respondent was asked to indicate the degree of emphasis each believed was being placed on each of the 32 subject matter areas of agriculture/agribusiness in their local vocational agriculture program over the last four years, using the following scale:

"3" = Major Emphasis - in-depth classroom instruction, for a significant length of time - 30 or more hours.

"2" = Moderate Emphasis - some classroom instruction, limited amount of time - 6 to 29 hours.

"1" = Little Emphasis - survey or overview type of instruction - one to five hours.

"0" = No emphasis - no content taught in this area.

A random sample of six schools was drawn from the 15 non-respondents, and a personal telephone call made to the six teachers to obtain a non-respondent sample to use in comparing respondents to non-respondents. A series of "t" tests were conducted for each respondent group. For each group, no differences were found between the initial respondent group and the non-respondent group for any of the 32 agriculture/agribusiness subject matter areas. The alpha level used was .05. It was determined that the data from the 33 schools was representative and could be analyzed as a representative sample of the population.

ANALYSIS OF DATA

An analysis of variance was then conducted to determine if there was a significant difference among the means for each of the 32 subject matter areas, for the three respondent groups. An alpha level of .01 was established.

In cases where a significant difference was found, the Scheffe' Test for unequal group sizes was conducted to determine which groups differed, using an alpha level of .05.

RESULTS

Responses were received from 33 school administrators (superintendents) 33 vocational agriculture teachers, and 273 senior vocational agriculture students. This was a 68.75 percent response. All were single teacher agriculture departments.

Significant differences were found among the three respondent groups for 19 of the 32 agriculture/agribusiness subject matter areas.

No significant difference were found among respondent groups for 13 of the 32 agriculture/agribusiness subject matter areas. School administrators

(Superintendents) believed greater emphasis was being placed on agriculture/agribusiness subject matter areas in local vocational agriculture programs in Nebraska than did both vocational agriculture teachers and senior secondary agriculture students in high school. Administrators rated 24 of the 32 agriculture/agribusiness subject matter areas as having greater emphasis in local programs than did either vocational agriculture teachers or senior agriculture students. For seven agriculture/agribusiness subject matter areas, administrators believed there was a significantly greater emphasis than senior secondary vocational agriculture students. For one agriculture/agribusiness subject matter area (High Value Crops) administrators believed there was a signficantly greater emphasis than vocational agriculture teachers. For five agriculture/agribusiness subject matter areas (Nos. 2, 9, 12, 17 and 19 in Table 1), administrators believed there was a significantly greater emphasis then both senior secondary vocational agriculture students and vocational agriculture teachers.

The thirteen agriculture/agribusiness subject matter areas for which school administrators had a significantly higher perception than one or both other groups included animal production, crop production, and farm business management.

For eleven agriculture/agribusiness subject matter areas administrators scored a higher, but not significantly higher perception than both senior secondary vocational agriculture students and vocational agriculture teachers.

CONCLUSIONS AND RECOMMENDATIONS

Vocational agriculture teachers and senior agriculture students agreed more in their perception of the emphasis placed on agriculture/agribusiness subject matter areas than did school administrators. Superintendents rated agriculture/agribusiness subject matter areas significantly higher than either vocational agriculture teachers or senior secondary vocational agriculture students in 13 of the 32 subject matter areas.

There was strong indication there is congruency in perception among the three groups more in the agricultural mechanics area than in any other agriculture/agribusiness subject matter area, as seven of the thirteen subject matter areas were in agricultural mechanics. The subject matter areas for which there was agreement seemed to be agricultural mechanics and supervised experience programs, in which activities were highly visible, and with subject matter areas in which little emphasis was perceived by all the groups.

The evidence indicates a wide difference in the perceptions of the emphasis on agriculture/agribusiness subject matter areas by the three groups studied, and limited agreement among the three groups with respect to the perceived emphasis placed on some agriculture/agribusiness subject matter areas.

It is recommmended that Nebraska vocational agriculture teachers improve the communication among all three groups concerning the amount of instructional time being spent on agriculture/agribusiness subject matter areas in the local program. This may be done through:

1. Annual review of the curriculum offerings with the school administrator and Board of Education.

2. Annual or semester review of agriculture/agribusiness subject matter areas to be covered with each class, as the school term begins.

Table 1

Mean Scores For Nineteen Agriculture/Agribusiness Subject Matter Areas For Which There Were Significant Differences Among The Three Respondent Groups.

Subject Matter Area	Admin	Mean Score	
		Teacher	Student
1. Agricultural Records,	2.696	2.735(c)	2.377
2. Financing The Farm Business	2.484(d)	2.029	1.791
3. Insurance	1.909(a)	1.529	1.256
4. Tax Management	1.878(a)	1.735	1.417
5. Leadership	2.818(a)	2.588	2.336
6. Agricultural Careers	2.212(a)	1.911	1.699
7. Beef Cattle Production	2.545(a)	2.232	2.139
8. Swine Production	2.303	2.176	1.798(e)
9. Small Animals	0.939(d)	0.441	0.476
10. Row Crop Production	2.212	2.264	1.783(e)
11. Small Grain Production	2.000(a)	1.764	1.454
12. Forage & Hay Production	2.060(d)	1.676	1.512
13. Metal Work	2.606	2.791(c)	2.402
14. Tractors	2.212	2.235	1.637(e)
15. Electricity	1.636	2.176(f)	1.560
16. High Value Crops	0.939(b)	0.352	0.600
17. Horticulture	1.121(d)	0.705	0.703
18. Soil Conservation Practices	2.454(a)	2.352	1.959
19. Marketing Agriculture Products	2.300(d)	2.058	1.819

(a) Significant difference between administrators and senior agriculture students, based on the Scheffe' Test.

(b) Significant difference between administrators and vocational agriculture teachers, based on the Scheffe' Test.

(c) Significant difference between agriculture teachers and vocational agriculture students, based on the Scheffe' Test.

(d) Significant difference between administrators and both vocational agriculture teachers and senior agriculcture students, based on the Scheffe' Test.

(e) Significant difference between senior agriculture students and both administrators and vocational agriculture teachers, based on the Scheffe' Test.

(f) Significant difference between vocational agriculture teachers and both administrators and senior agriculture students, based on the Scheffe' Test.

Table 2

Mean Scores For Thirteen Agribusiness Subject Matter Areas For Which No Significant Differences Were Found Among Perceptions of The Three Respondent Groups.

Subject Matter Area	Mean Score		
	Admin	Teacher	Student
1. Supervised Experience programs (Production Projects, School Land, Lab Experience on Farm or on Job Placement, and Record Keeping)	2.606	2.647	2.347
2. Processing Agricultural Products (Cereal Grains, Meat, Eggs, Vegetables)	1.606	1.294	1.230
3. Sheep Production (Ewe & Lamb, Feedlot, Purebred Breeder)	1.666	1.647	1.377
4. Horse Production (Purebred Breeder, Trainer, Racing Horses)	1.000	0.676	0.659
5. Agricultural Field Machinery (Hand & Power Tool Care, Maintenance, Calibration)	2.272	2.176	2.007
6. Small Engines (Overhaul & Maintenance)	2.060	2.058	1.611
7. Machinery Service & Sales (Parts Person, Sales, Bookkeeping)	1.272	1.088	1.080
8. Concrete Work (Foundations, Slabs)	1.151	1.264	0.934
9. Carpentry (Hand & Power Tool Care, Small Building Construction)	1.939	2.058	1.688
10.Renewable Natural Resources (Fish & Wildlife, Pollution, Forestry, Recreation)	1.333	0.941	1.032
11. Dairy Production (Milk Production, Purebred Breeding)	1.818	1.441	1.373
12. Irrigation Equipment Maintenace	1.363	1.029	0.908
13. Machinery and Equipment Management	2.212	1.676	1.797

Perceptions Regarding Planning and Educating for Diversified Agricultural Production in Iowa

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INTRODUCTION

Traditionally, education in agriculture has centered around production agriculture (Phipps, 1980). The main agricultural emphasis in Iowa has been on production of corn, soybeans, and various types of livestock, mainly swine and beef. However, the agriculture industry is much broader. There are seven occupational areas in agriculture: production, horticulture, sales and services, forestry, products and processing, natural resources and agricultural mechanics. (Caves et al 1982; Vocational Agriculture Orientation Handbook, 1984). If the latter six areas are to survive in Iowa, there must be a sound production agriculture (Crom, 1985). Diversity in production is the key (HORIZON, 1985). Research is needed to attempt to answer some of the key questions regarding diversification of agricultural production (Crom, 1985). What additional crops could be grown in Iowa? According to Stutzman (1985) nearly 80 percent of the fruits and vegetables consumed annually in Iowa are produced outside of the state. Could some of these crops be grown in Iowa? Are Iowans ready to diversify? What education is required to promote and enhance diversification of agricultural production? What are the economic implications of a more diverse production system in Iowa? Currently, what is being done to educate young people and adults of the possibilities in diversifying agricultural production in Iowa? What more could be done?

PURPOSE AND OBJECTIVE

The main purpose of this study was to identify current perceptions and attitudes of Iowans regarding diversification of the agricultural production industry. The specific objectives of the study were as follows:

1. To determine the perceptions of selected agricultural extension specialists, vocational agriculture teachers, and young/adult farmers regarding diversification of agricultural production in Iowa.
2. To identify new crops and livestock enterprises for Iowa's agricutural industry as perceived by the above mentioned groups.
3. To assess the need for education in diversification of agricultural production as perceived by the above mentioned groups.

PROCEDURES

The study was designed to collect data to identify the current perceptions of Iowans regarding diversification of agricultural production.

Data were collected by self-administered mailed questionnaires sent to a randomly selected group of agricultural extension specialists, vocational agriculture teachers, and young/adult farmers.

A list of agricultural extension specialists (100+) was obtained from the Iowa Directory of Extension (1985) provided by the Cooperative Extension Service at Iowa State University. The Vocational Agriculture Teachers Directory (1985) provided by the Iowa Department of Public Instruction was used to develop a list of vocational agriculture teachers (280). The Iowa Young Farmers Educational Association membership roster provided by the Iowa Department of Public Instruction was used to develop a list of farmers (400).

A random sample of 150 agricultural extension specialists, vocational agriculture teachers, and young/adult farmers was selected from the sub-populations described above to participate in the study. The table of random numbers was used to select 50 participants from each of the three sub-population groups.

The questionnaire was developed utilizing the assistance of selected agricultural experts, specialists and educators not included in the sample. Respondents were asked to rate various items on a 1 to 5 scale (1 = strongly disagree; 5 = strongly agree) regarding the educational needs and potential crop and livestock diversification options in Iowa, as well as attitudes regarding various statements about diversification of the agricultural production industry. A reliability estimate (Cronbach Alpha) was computed for the instrument and it was determined to be appropriate for this study (.86).

Questionnaires were sent the second week of December, 1985. Reminder letters were sent 2 weeks after the initial questionnaires were posted. Forty two agricultural extension specialists, 44 vocational agriculture teachers, and 50 farmers responded to the survey instrument. Follow-up telephone contact was made with one-half of the non-respondents. Selected questions were asked of these non-respondents and the responses were compared with those of the respondents. There were no differences found between non-respondents and respondents.

ANALYSIS OF DATA

The data were analyzed using the Statistical Package for the Social Sciences (SPSSX, 1983). Means, standard deviations, frequencies, and one-way analysis of variance were used to analyze the data. The a priori alpha level was set at the .05 level.

FINDINGS/RESULTS

Demographic Data

Selected demographic data were collected to describe the participants in the study. The groups were composed of 42 agricultural extension specialists (84 percent response rate), 44 vocational agriculture teachers (88 percent response rate), and 50 young/adult farmers (100 percent response rate).

The agricultural extension specialists described themselves as follows:

88.0% were males;
79.0% were between 20 and 49 years of age;
11.9% had Bachelors degree;
7.1% had Masters degree;

81.0% had more than Masters degree
9.5% had net income of $20,000 or less;
90.5% had net income over $21,000.

The vocational agriculture teachers described themselves as follows:

95.5% were males;
79.6% were between 20 and 49 years of age;
84.1% had Bachelors degree;
9.1% had Masters degree;
6.8% had more than Masters degree;
38.6% had net income of $20,000 or less;
61.4% had net income over $21,000.

The young/adult farmers described themselves as follows:

92.0% were males;
84.4% were between 20 and 49 years of age;
24.0% had at least a 12th grade education;
36.0% had some college or technical education;
10.0% had an Associates degree;
30.0% had a Bachelors and/or Masters degree;
62.0% had net income of $20,000 or less;
38.0% had net income over $21,000.

Attitudes Toward Diversification

This section of the questionnaire contained 36 attitude statements regarding diversification of agricultural production in Iowa. As a group, the respondents tended to agree on a number of items under this section.

The following list is a summary of the highest rated items. (Total mean scores = 3.5 or > on a 5 pt. scale)

1. Iowa farmers need to diversify their agricultural production.
2. Research is needed to answer some key questions regarding diversification of agricultural production. ie. What crops are best for Iowa? What markets are available? What markets could be developed?
3. Production in agriculture will continue to grow.
4. Foreign markets for agricultural production should be increased.
5. New agricultural products need to be developed.
6. Farmers need to know more about marketing.
7. Iowa farmers should develop more local markets for the products they now grow.
8. Iowa farmers should practice crop rotation.
9. Farmers should consider perennial crops and cropping systems.
10. Farmers must keep up-to-date and apply new production methods in agriculture to be able to survive.
11. In order to survive, farmers must apply new management techniques.

On the other hand, as a group, the respondents tended to disagree with several of the attitude statements.

The following list is a summary of the lowest rated items. (Total mean score = 2.7 or lower on a 5 point scale)

1. Profits are greatest when production is maximized.
2. There is little need for diversified agricultural production in Iowa.
3. Iowa farmers should continue to do what they do best (ie. grow corn, beans, cattle, hogs) and forget about diversification.
4. At the present time, adequate information is available regarding diversification of crop production.
5. In order to stay in farming, a farmer has to keep trying out new crop and livestock enterprises.
6. Farmers waste too much money and time learning about new crops and livestock enterprises.

New Enterprises

The respondents were asked to indicate prospective crop and livestock enterprises that should be promoted in Iowa in an effort to diversify agricultural production. The crops rated most highly by the respondents by rank order mean values included: oats (3.56), sweet corn (3.47), vegetables in general (3.40), strawberries (3.39), apples (3.33), wheat (3.30), and raspberries (3.20).

Vocational agriculture teachers rated fruits and vegetables (in general), strawberries, raspberries and sweet corn significantly higher (.05 level) as prospective diversified crops than did farmers and Extension specialists. Oats was rated significantly lower as a viable crop for diversification by the Extension specialists.

In ranking various fruits and vegetables as prospective crops, the respondents indicated that the top two vegetable crops that should be promoted included (1) potatoes and (2) beans. The top two fruit crops deserving attention included (1) apples and (2) strawberries.

Other crops included in the study were barley, crambe, rape seed, sunflower, triticale, cherries, watermelon, plums, pumpkins, cabbage, brocolli, cucumbers and cauliflower.

The livestock enterprises rated most highly by the respondents by rank order mean values included: sheep (3.43), turkeys (3.35), broilers (3.29), and chickens (layers) (3.20).

Vocational agriculture teachers rated broilers, rabbits and mink enterprises significantly higher as prospective viable livestock enterprises than did farmers and Extension specialists.

Other enterprises included in the study were horses, bees, and pheasants.

Education Programming

Overall, the respondents clearly emphasized that educational programs are required to promote diversification of agricultural production. According to the respondents, planning for education in diversification of agricultural production should involve program participants (Mean 4.26 on a 5 point scale), Cooperative Extension professionals (4.20), vocational agriculture teachers (3.98) and private companies (3.96).

Respondents indicated that the focus of these educational programs should be on two critical elements: teachnical information (4.21) and developing practical skills (4.21).

In addition, the respondents placed emphasis on these specific content areas for education in diversification on agricultural production: marketing - when and how (4.30), environmental factors (4.30), determining cash flow budgets (4.28), awareness about profit potential (4.18) and enterprise analysis (4.20).

Upon using the Schefe' procedure to determine differences between group means it was found that the Extension specialists rated the role of program participants in program planning significantly higher than the farmers in the study.

Teachers rated the need for a needs assessment in planning educational programs significantly higher than Extension professionals. Extension professionals rated the need for programs to emphasize technical information and practical skills significantly higher than farmers in the study.

CONCLUSIONS

The findings of the study indicated the respondent groups agreed that there is a need to study diversification of agricultural production in Iowa. There does not appear to be enough information available to make informed decisions about diversification of crops and livestock in Iowa. Markets are not readily available for a variety of crops and livestock.

The respondent groups were not very certain regarding the suggested new crop and livestock enterprises to be introduced, and agreed that educational programs are required to promote and enhance diversification in agriculture. The respondent groups also agreed that the focus of educational programs should be on providing technical information that is up-to-date and practical.

Generally the groups agreed that educational program participants should be involved in the planning of educational programs on diversification.

The respondent groups also agreed that the following items need to be the focus of educational programs (4.15 and above on a 5 point scale) technical information, practical skills, planning, resource analysis, profit potential, marketing, enterprise selection, least-cost analysis, budgeting, and setting goals.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made:

1. Further research is needed regarding diversification of agricultural production in Iowa.

2. It is recommended that a study be conducted to determine competencies needed by Iowa farmers for various suggested new crop and livestock enterprises.
3. Research needs to be conducted to determine what technical competencies adult educators should possess to assist farmers with new and emerging enterprises.
4. The results of this study should be shared with farmers and individuals responsible for planning and providing services for them.

IMPLICATIONS

The study identified current perceptions and attitudes of key participants in the agricultural industry regarding diversification of agricultural production in Iowa. The study provides the framework for conducting state-funded feasibility studies and economic analysis of a variety of non-traditional cropping systems suitable for Iowa. This information could lead to development of a systematic approach to attracting agri-business capital investment to the state as well as other investment opportunities.

The results of the study also underscore the need for considerable effort to be put forth regarding research on and education about a variety of crop and livetock options available to producers in Iowa.

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Perceptions Regarding Planning and Educating For Diversified Agricultural Production
A Critique

Alfred J. Mannebach, University of Connecticut -- Discussant

The author is to be commended on identifying an important topic for study. If the production base for agriculture can be broadened, the number of farm as well as non-farm agricultural workers should increase and the demand for additional education should, based on the information presented in the paper, rise. The paper had the following specific strengths: (1) the introduction, need and rationale for the study were well stated; (2) the purposes were stated explicitly; (3) the researchers obtained a high response rate; (4) important data regarding attitudes toward diversification, new enterprises and educational programming were presented; (5) the conclusions and implications were well thought out and (6) overall, the paper was well written.

Weaknesses as perceived by the discussant were: (1) The review of research was limited. No data were shown to explain the extent to which diversified agricultural production efforts were being tried in Iowa. No reports of the success or failure of past efforts to diversity were presented. (2) The study was limited to perceptions. No data were presented regarding the extent to which persons surveyed were aware of or were involved in diversified agriculture. The study would have been strengthened if the respondents could have expressed whether or not they were aware of or involved with diversification efforts, the areas of diversification experienced, and the extent to which the diversification efforts have been successful and profitable. (3) No rationale was presented regarding sample size selected. (4) Information regarding the instrument developed for the study was limited. Demographic data are presented in the findings. However, no mention of demographic data was made in the section in which the questionnaire was discussed. A reliability estimate for the instrument used was reported. However, no mention was made of the number or composition of the group involved. (5) The demographic data were poorly presented and were of little value to the study. The age category presented was too broad to be meaningful (30 years) and was not comprehensive. Data presented regarding degree attained were misleading because they were not put in the context of "highest degree attained." Two categories of net income were reported. A decrease in the size of the categories and an increase in the number of categories would have made the data more meaningful. (6) An attitudinal questionnaire was the primary instrument used in the study. Although more difficult to quality, open ended questions may have elicited more meaningful data. (7) Recommendation number two states that a study should be conducted to determine competencies needed by Iowa farmers for various suggested new crop and livestock enterprises. Perhaps success and profitability of certain enterprises should be determined before competency studies are conducted.

In summary, the study does raise important questions and presents specific recommendations for diversifying Iowa agriculture in the future. An important outcome of the study is that individuals from key constitutient groups are debating the possibilities and issues.

PERFORMANCE-REWARD CONTINGENCIES: THE ROLE AND RELATIONSHIPS OF PERCEIVED EQUITY IN THE JOB PERFORMANCE-JOB SATISFACTION QUESTION

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INTRODUCTION

The success of the Cooperative Extension Service as a leading educational organization comes from involvement of field faculty working face-to-face with clientele at each step of the learning process (Lawrence, 1974). This is best accomplished when the staff offering leadership to community residents includes high-level performers who are well-trained and maintained; a condition which should produce a consistent and continuous pattern of leadership. In Extension, because of the importance and complexity of the field faculty positions, the assurance of satisfaction of individuals comes through personnel development activities and an appropriate, equitable reward system. The better the Extension Service can perform these management tasks, the more continuity Extension programming should possess (Smith, 1985).

Employee satisfaction has long been a major concern of organizations like the Extension Service (Cunningham, 1986). Turnover and absenteeism are two major consequences of dissatisfaction among employees and both have proven disruptive to the continuity and quality of Extension programming (Clark, 1981; Van Tilburg, 1986). When high level performers are being affected, the negative results of dissatisfaction are even more pronounced within the organization. Thus, administrators of labor-intensive organizations like Extension would benefit from a better understanding of the relationship between job performance and job satisfaction. Increased knowledge of the individual processes involved in employee performance and satisfaction would be an important step in the management of absenteeism, turnover and other detrimental behaviors associated with organizational productivity and ultimate success.

Job Performance and Job Satisfaction

Most of the research investigating the job performance-job satisfaction relationship has shown only a slight positive relationship between the two (Fisher, 1980). The original hypothesis explored suggested a positive relationship between satisfaction and performance with satisfaction affecting performance (Brayfield & Crockett, 1955). Later research reversed the hypothesized causality and suggested that performance led to satisfaction, but still major literature reviews reported that the relationships found were slight or non-existent (Lawler, 1973; Steers & Porter, 1983).

One study (Cherrington, Reitz, & Scott, (1971) based on a model of satisfaction presented by Lawler and Porter (1967) found that an important consideration when proposing a relationship between performance and satisfaction was the existence of a performance-contingent reward system. The model implied that only under performance-contingent reward systems would employee performance be positively related to satisfaction. This model suggested that high performance would lead to high satisfaction if employees perceived that there was an equitable reward system within the organization. This condition has been referred to as a perceived performance-extrinsic reward contingency.

Also included in the Lawler model was an intrinsic reward contingency ("I reward myself when I perform well."). It follows that the performance-satisfaction relationship would also be moderated by this variable. To adequately address the role of the performance-reward contingency in the performance-satisfaction relationship, both types of rewards must be considered.

PURPOSE AND OBJECTIVES

The purpose of the study was to investigate the relationship between reward contingencies and the levels of job performance and job satisfaction of Cooperative Extension Service County agents. Of particular interest was the role that perceived extrinsic rewards played in the job performance-job satisfaction relationship.

The objectives of this study were to:

1. Describe the population on each of the following variables: self-rating of job performance; overall job satisfaction; satisfaction with the pay, promotion, co-workers, the work itself, and supervision; agent program area; perceived performance-intrinsic reward contingency; and perceived performance-extrinsic reward contingency;
2. Determine relationships among selected variables;
3. Determine if there were moderating effects of certain selected variables on the relationship between other selected variables; and
4. Determine if there were differences between groups on selected variables.

The following hypotheses were developed to address objectives two, three, and four:

1. Satisfaction with pay, promotion, and supervision will be positively related to the perceived job performance-extrinsic reward contingency.
2. Satisfaction with co-workers and the work itself will be positively related to the perceived job performance-intrinsic reward contingency.
3. Overall job satisfaction will be positively related to both of the perceived job performance-reward contingency variables.
4. The perceived job performance-extrinsic reward contingency will moderate the relationships between job performance and all job satisfaction variables.
5. The perceived job performance-intrinsic reward contingency will moderate the relationships between job performance and all job satisfaction variables.
6. There is a relationship between program responsibility area and job satisfaction variables.
7. There is a relationship between program responsibility area and both perceived job performance-reward contingency variables.

PROCEDURES

The design of the study was correlational in nature, allowing the researcher to investigate relationships among variables.

Population

The population consisted of all Ohio Cooperative Extension Service County agents under contract March 1, 1985. Names were obtained from a validated list secured from the Ohio Cooperative Extension Service. The validation process controlled for selection and frame error. The population (N=244) included agriculture agents (N=94), home economics agents (N=80), and 4-H youth agents (N=70).

The entire population was used in the study (controlling sampling error) and was referred to as a sample of all populations of Ohio Cooperative Extension Service county agents who might have been employed by the Ohio Cooperative Extension Service at other points in time. This logic permitted the use of inferential statistics in the data analysis.

Data Collection

The data were collected during the month of May, 1985 using a mail questionnaire. Following suggestions by Dillman (1978), a follow-up procedure was used to obtain an acceptable response rate. The total number of respondents for the mail questionnaire was 229 (accepting sample = 94 percent). Data for 218 agents were usable (data sample = 89 percent). Generalizability of the results of the study was determined by comparing early respondents with late respondents on all variables using t-tests (Alpha=.05). No differences were found; thus, using the logic that late respondents are most like non-respondents (Miller & Smith, 1983), results were generalized to the entire population.

Instrumentation

The mail questionnaire contained three parts: (1) Likert-type items scaled very strongly disagree = 1 to very strongly agree = 6, (2) demographic items, and (3) the Job Descriptive Index (Smith, Kendall, & Hulin, 1969) which measures facets of job satisfaction. Content validity was determined using a panel of experts. Reliability was determined using a pilot test of Ohio Cooperative Extension Service district personnel producing Cronbach's alphas ranging from .70 to .95. Cronbach's alphas obtained from the data sample ranged from .77 to .91.

DATA ANALYSIS

Descriptive statistics (frequencies, percentages, measures of central tendency, and variability) were used to organize and summarize the data. Correlational and regression techniques (multiple regression, moderated regression as recommended by Pedhazur (1982), and Pearson correlation coefficients) were used to determine the nature and strength of relationships and moderating effects of variables on relationships between other variables. Analysis of variance and t-tests were used to compare groups on selected variables. Alpha levels were set a priori at .05.

RESULTS

Results are organized by objectives. The following scales and interpretations were used:

1. Satisfaction with pay and promotion were measured using a scale of zero to 27 with zero representing the absence of satisfaction.
2. Satisfaction with supervision, co-workers, and the work itself were measured using a scale of zero to 54 with zero representing the absence of satisfaction.
3. Perceived job performance-reward contingency variables, overall job satisfaction, and job performance were measured using a six point Likert-type scale interpreted in the following manner: scores of 1.00 to 3.50 will indicate disagreement, scores of 3.51 to 6.00 will indicate agreement.

Objective One

Agents reported a moderate amount of overall job satisfaction ($\bar{x}$=4.42, sd=.76) but had varying amounts associated with specific components of the job depending on the particular facet being measured.

Findings suggested that many agents were not satisfied with promotion opportunities. Even though the average score ($\bar{x}$=10.96; sd=7.18) fell in the medium range of satisfaction, over 37 percent of all agents reported low scores for promotion. Similar to those findings were the results of satisfaction with pay with the mean score 15.26 (sd=5.40). Only 20 percent, however, scored in the high range and ten percent were in the low range.

Agents scored medium to high on the facet, the work itself. The average score was 39.95 (sd=5.70). Most agents were even more satisfied with their supervision with sixty percent in the high range ($\bar{x}$=41.46; sd=10.72).

The facet of the job that respondents were most satisfied with was their relationships with co-workers ($\bar{x}$=44.37; sd=9.94).

Agents tended to reward themselves intrinsically for good performance with 97 percent of the agents in agreement with the intrinsic reward contingency ($\bar{x}$=4.73; sd=.67). Forty-two percent of the respondents disagreed, however, that the organization had a performance-contingent reward system with the mean score of 3.65 (sd=.73)on the extrinsic reward contingency being the lowest in the study. Agents rated themselves as moderately high performers with all agents but one scoring above 3.50 ($\bar{x}$=4.73; sd=.41). Program areas were evenly represented in the study: Agriculture = 38%, Home Economics = 33%, and 4-H Youth = 29%.

Objective Two

To aid in description of relationships, the scale suggested by Davis (1971) was used. Data for objective two appear in Table one. Results supported hypothesis one. Substantial positive relationships were found between satisfaction with pay and promotion and with the extrinsic reward contingency (r=.54, r=.52, respectively). A moderate positive relationship was found between satisfaction with supervision and the extrinsic reward contingency (r=.48).

Results for hypothesis two were mixed. No relationship was found between satisfaction with co-workers and the intrinsic reward contingency (r=.04) but a moderate positive relationship between the work itself and the intrinsic reward contingency was indicated by the .30 correlation coefficient.

Hypothesis three was supported with results indicating that overall job satisfaction is positively related to both contingency variables. The relationship was moderate for the extrinsic reward contingency (r=.36) and substantial for the intrinsic reward contingency (r=.50).

Table 1

Pearson correlation coefficient for the relationships between variables

	Perceived Job Performance	Overall Job Satisfaction	Satisfaction with					Extrinsic Reward Contingency	Intrinsic Reward Contingency
			Pay	Promotion	Work Itself	Co-Workers	Supervision		
Perceived Job Performance	1.00								
Overall Job Satisfaction	.26	1.00							
Satisfaction with Pay	-.11	.33	1.00						
Satisfaction with Promotion	-.09	.22	.28	1.00					
Satisfaction with Work Itself	.10	.50	.26	.25	1.00				
Satisfaction with Supervision	-.05	.24	.27	.35	.26	.28	1.00		
Extrinsic Reward Contingency	.04	.36	.54	.52	.36	.36	.48	1.00	
Intrinsic Reward Contingency	.35	.50	.05	.04	.30	.04	.14	.11	1.00

Objective Three

Hypotheses four and five suggested that the reward contingency variables would moderate any relationship found between job performance and job satisfaction. Data for these hypotheses appear in tables two and three.

The job performance-extrinsic reward contingency was not found to be a moderating variable but instead was determined to have a direct effect on satisfaction as indicated by significant variance increments for the contingency variable in all regression models.

The only significant interaction (indicating the moderation of a relationship) found was associated with satisfaction with promotion but the moderating variable appeared to be job performance rather than the contingency variable. (The change in R2 of .04, though statistically significant was small enough to question the practical significance of the findings.) The interaction was ordinal and indicated that high performers' satisfaction with promotion increased as perceptions of equity of the reward system increased but at a slower rate than the increase associated with low performers.

The intrinsic reward contingency was also not found to moderate the relationship between performance and satisfaction. The only significant interaction (associated with satisfaction with supervision) was again an indication that job performance moderated the relationship between the contingency variable and satisfaction and not the reverse. (The change in R2 was .02, and again the magnitude suggests the question of practical significance.) This interaction was disordinal and suggested that if agents were high performers, their satisfaction with supervision would increase as their perceptions of the intrinsic contigency increased but if they were low performers, the opposite relationship was true.

Table 2

Results of moderated regression of the interaction of job performance-extrinsic reward contingency and self-rating of job performance in the prediction of job satisfaction variables

	Self-rating of job performance			Performance-Extrinsic Reward			Interaction		
Dependent Variable	Change in R^2	df	F	Change in R^2	df	F	Change in R^2	df	F
Overall job satisfaction	.060	(1,215)	*16.10	.119	(1,215)	*31.43	.002	(1,214)	.48
Satisfaction with promotion	.012	(1,215)	3.55	.277	(1,215)	*83.03	.040	(1,214)	*12.67
Satisfaction with pay	.018	(1,215)	*5.37	.299	(1,215)	*93.26	.003	(1,214)	1.00
Satisfaction with the work itself	.008	(1,215)	1.99	.123	(1,215)	*30.58	.000	(1,214)	.06
Satisfaction with co-workers	.001	(1,215)	.12	.127	(1,215)	*31.22	.001	(1,214)	.12
Satisfaction with supervision	.005	(1,215)	1.36	.234	(1,215)	*66.00	.000	(1,214)	.08

*p <.05, F_{crit}3.89

Objective Four

Hypotheses six and seven addressed objective four; Analysis of Variance was used to test the differences among the three program responsibility areas on the six job satisfaction measures and the two reward contingency variables.

4-H youth agents scored significantly lower (alpha = .05) than both

Agricultural and Home Economics agents on three measures of satisfaction (overall satisfaction (F=6.33), satisfaction with pay (F=3.47), and satisfaction with the work itself (F=12.40)) as well as the extrinsic reward contingency (F=3.32). In fact, 4-H youth agents scored lowest on all measures of satisfaction and both contingency variables.

Table 3

Results of moderated regression of the interaction of job performance-intrinsic reward contingency and self-rating of job performance in the prediction of satisfaction variables

	Self-rating of job performance			Performance-Intrinsic Reward			Interaction		
Dependent Variable	Change in R^2	df	F	Change in R^2	df	F	Change in R^2	df	F
Overall job satisfaction	.008	(1,215)	2.32	.192	(1,215)	*55.66	.007	(1,214)	2.04
Satisfaction with promotion	.012	(1,215)	2.58	.006	(1,215)	1.34	.008	(1,214)	1.85
Satisfaction with pay	.018	(1,215)	3.86	.008	(1,215)	1.72	.004	(1,214)	.85
Satisfaction with the work itself	.000	(1,215)	0.00	.007	(1,215)	*18.26	.006	(1,214)	1.42
Satisfaction with co-workers	.001	(1,215)	.13	.001	(1,215)	.17	.010	(1,214)	2.13
Satisfaction with supervision	.011	(1,215)	2.44	.028	(1,215)	*6.26	.020	(1,214)	*4.62

*$p < .05$, F_{crit} 3.89

CONCLUSIONS AND RECOMMENDATIONS

1. High satisfaction with intrinsic components of the job (co-workers and the work itself) and lower satisfaction with extrinsic components (pay, promotion, supervision) as well as low scores on the extrinsic reward contingency and high scores on the intrinsic reward contingency indicate that agents tend to reward themselves for high performance while they perceive that the organization does not. The Extension Service should investigate the actual reward contingencies in place to determine equity of the reward system. In addition, importance must be placed on administrative awareness of perceptions and attitudes of employees.

2. The high correlations between the contingency variables and measures of satisfaction indicate that organizations concerned with satisfaction levels among employees should pay particular attention to perceptions of equity of the reward system. The lack of significant interactions between performance and perceived equity indicate that, generally, if the condition exists (perceived equity or inequity), it exists regardless of performance level.

3. Although Agriculture and Home Economics agents tended to agree on most measures, 4-H youth agents scored lower than the other two groups on all variables and significantly lower on some variables. Specific steps should be taken to investigate reasons for the discrepancy and a developmental plan should be established to begin to address some of the issues involved.

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Performance - Reward Contingencies: The Role and Relationships of Perceived Equity in the Job Performance - Job Satisfaction Question

A Critique

Vernon D. Luft, North Dakota State University -- Discussant

The researcher is to be commended for conducting an interesting and important study. It certainly has implications for maintaining or improving morale and job satisfaction among Cooperative Extension employees as well as other professions. The purpose of the study was to investigate the relationship between reward contingencies and the levels of job performance and job satisfaction of Cooperative Extension Service county agents.

Strengths

I compliment the author for preparing a report that was very well written. Other strengths of the study are:

1. The introduction was well organized and built a need for the study.
2. The purpose and objectives were clearly stated. Hypotheses were used to complement some objectives.
3. Sound data collection procedures were used, enabling the researcher to generalize to the entire population.
4. Content validity and reliability of the instrument was determined.
5. Statistical procedures appropriate to the study were used.
6. The results are clearly presented in the report. Tables are clear and concise. Organization of the paper was excellent.
7. The conclusions and recommendations are clearly stated; and are supported by the reported results.

Weaknesses

Because this is a quality piece of research, few weaknesses were found. Some that I would raise for discussion purposes are:

1. The title, although quite lengthy already, could be more descriptive. The question I asked as I read the title was, "Of whom?".
2. The procedure of using the entire population as a sample of all populations of Ohio county agents who might have been employed at other points in time as logic to use inferential statistics in the data analysis raises some questions. Is this process used in order to generalize to other points in time? If so, my question is, "Why?". What difference does it make? There is a chance that extraneous variables over periods of time (i.e. changes in organizational administration, economy, morale, and job requirements) may confound the research and hinder its generalizability.

The researcher has conducted a study that should be useful to her in working with the Cooperative Extension Service. I compliment you for doing quality research.

PERSONALITY TYPES OF 500 FARM COUPLES -- IMPLICATIONS FOR AGRICULTURAL EDUCATORS DURING CRITICAL ECONOMIC CONDITIONS

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Introduction

People in agriculture are experiencing economic difficulties. Stress-producing events such as foreclosures result in increases in depression, divorce, suicide and child abuse. How one handles problems is influenced by personality. This paper reports on the personality types of 500 farm couples, along with implications for agricultural educators as they work with and attempt to help these uniquely vulnerable types to cope with stress.

Jungian psychological type theory has been used in numerous studies to understand various populations. However, little has been done with regard to understanding rural/agricultural people. Barrett and Horner (1985) formulated a profile of rural leadership and found them to have types different from the general population. Likewise, Barrett and Sorenson (1985) found students in the College of Agriculture to be different. Horner and Foster (1985) developed a national profile of teacher educators and state supervisors in agriculture. They too were different from the general population.

Purposes and Objectives

The major purpose of this study was to develop a psychological type profile of farm couples. Specific objectives were to:

1. profile by psychological type 500 farm couples in Nebraska.
2. determine if type differences exist between farm males and females.
3. compare the personality types of farm couples with the general population and a base population of 33,201.
4. derive implications useful for agricultural educators and others as they communicate with, counsel and educate farm couples or individuals facing stressful situations.

Procedure

The Myers-Briggs Type Indicator (MBTI) Form G, being a well-researched instrument, was determined to be most appropriate for collecting data for this study. It is reported in Advances in Psychological Assessment, and documented by numerous studies, to have a reliability of .85. The sample population consisted of 1,026 farm adults (526 males and 500 females). The MBTI was administered in connection with, and mailed to participants prior to workshops.

Data for this staff study were collected from October, 1985 to May 1986.

Analysis of Data

Individuals were classified and analyzed by the 16 MBTI preference types, the four temperament types (Keirsey and Bates, 1978) and by the components within the four dichotomous preference scales related to lifestyles and the way information is perceived and decisions made. That is:

1. E-I - Extraverts (E) prefer to obtain energies from people and things. Introverts (I) gain energy from inner concepts and ideas. The E-I ratio is 75:25 in the general population (Keirsey, 1978).

2. S-N - Sensing individuals (S) gather information through the five senses. Intuitives (N) prefer to gather concepts beyond their senses. The S-N ratio is 75:25

3. T-F - Thinkers (T) prefer to make decisions based on logic. Feelers (F) prefer to make decisions using values and how these decisions affect people. The T-F ratio is 50:50.

4. J-P - Judging (J) individuals prefer to live by structure and order. Perceiving (P) individuals live more spontaneously. A 50:50 J-P ratio is found in the general population.

Percentage comparisons within each variable were made between men and women in the sample, between the sample and the "general population" and between the sample and a "base population" of 33,201 available from the Center for Application of Psychological Type (CAPT) Gainesville, FL. The Selection Ratio Type Table (SRTT) was used for data analysis and presentation.

The SRTT uses Chi-Square, and where necessary, Fisher's Exact Probability statistics to test for the presence of differences in density between groups within each variable. A probability level of 5% was selected to indicate significance.

Results

The findings of this study indicate that farm men and women, as a group, have quite similar but different psychological type profiles. The Type Table (Chart A) shows that more of the sample was Introverted than Extraverted (significant .001), although men tended to be more so, 57% compared to 52% women. The general population, according to Keirsey and Bates, has only 25% Introverts. Farm men and women were more sensing than Intuitive (73% to 28%), different from the base (CAPT) population of 33,201, but not different from the general population.

The greatest difference between men and women was on the decision dimensions of Thinking and Feeling. Men had a Thinking preference of 78%, while women preferred (62%) the Feeling function, significant at the .001 level. The general population is near a 50%-50% split on Thinking and Feeling. The lifestyle dimension, Judging and Perceiving, usually considered 50% J and 50% P was also different from the general population, significant at the .001 level. This sample was 70% judging.

MBTI TYPES OF 1026 FARM ADULTS

TYPE TABLE

(526 MALES & 500 FEMALES)

		SENSING TYPES						INTUITIVES						
		WITH THINKING			WITH FEELING			WITH FEELING			WITH THINKING			
		%/pop.	N	%/sample	%/pop.	N	%/sample	%/pop.	N	%/sample	% pop.	N	%/sample	
INTROVERTS JUDGING			**ISTJ**			**ISFJ**			**INFJ**			**INTJ**		JUDGING INTROVERTS
	M		133	25		32	6		7	1		27	5	M
	F		71	14		89	18		21	4		14	3	F
	T	6	204	20	6	121	12	1	28	3	1	41	4	T
INTROVERTS PERCEPTIVE			**ISTP**			**ISFP**			**INFP**			**INTP**		PERCEPTIVE INTROVERTS
	M		54	10		16	3		10	2		21	4	M
	F		8	2		29	6		24	5		5	1	F
	T	6	62	6	6	45	4	1	34	3	1	26	3	T
EXTRAVERTS PERCEPTIVE			**ESTP**			**ESFP**			**ENFP**			**ENTP**		PERCEPTIVE EXTRAVERTS
	M		23	4		15	3		9	2		29	6	M
	F		12	2		24	5		32	6		5	1	F
	T	13	35	3	13	39	4	5	41	4	5	34	3	T
EXTRAVERTS JUDGING			**ESTJ**			**ESFJ**			**ENFJ**			**ENTJ**		JUDGING EXTRAVERTS
	M		108	21		15	3		11	2		16	3	M
	F		60	12		58	12		28	6		20	4	F
	T	13	168	16	13	73	7	5	39	4	5	36	4	T

M = MALES F = FEMALES T = TOTAL

CHART A

Highlights extracted from the tabled data were:

- The distribution by Temperament Types expected in the general population along with the temperaments of 1,026 Farm men and women in this sample (shown in parentheses) are: SJ 38% (55*), SP 38% (18), NT 12% (13*), NF 12% (14*).

  Asterisks indicate that SJ's are significantly over-represented among farm folks while intuitives are under-represented in contrast with the 33,201 CAPT population.

- When farm men and women were compared by component, there appeared to be no great difference except on the TF element. However, in combinations, with the exception of SJ all differed significantly, with the men showing up disproportionally in the SP and NT and the women in the NF categories.

- Now, with focus on the dominant, a look at Introverted Sensors reveals significantly more ISTJ and ISFJ among farmers in comparison with the CAPT base (and of course with the 6% expected in the general population). And, as might be expected, the farm males appeared more often with the T and Females with the F function.

- Among the Extraverted Sensors, though considerably below the 13% expected in the general population, no such significant differences appeared either between the farm males and females or between them and the CAPT population.

- A look at the Introverted Thinkers in the farm population shows more ISTP's and less INTP's than found in the CAPT base. Significantly more farm men than women were ISTP and INTP.

- In reviewing the Extraverted Thinking group in comparison with the CAPT base, it was noted that a significantly greater number of ESTJ's appeared, and that due to significantly more males than females. On the other hand, a disproportionately low number of ENTJ's showed up in the farm sample.

- Introverted Feelers came up shy in the 500 farm couples, particularly male ISFP's and INFP's.

- Likewise, among Extraverted Feelers in the farm sample, significantly less men than women were ESFJ and ENFJ.

- Introverted Intuitives among the 1,026 farm population were shy of the CAPT base, but particularly so for INFJ men. A shortage of INTJ women also exists.

- Extraverted Intuitives were significantly obvious in their absence, lower than expected numbers appeared in both the ENFP and ENTP groups in comparison to both the general population and that used in the CAPT base. Again the males were signficantly less F and females significantly less T.

- As regards Attitude of the farm sample, both males and females were strongly, almost equally Introverted - (55%) significantly more so than the base population and well above Keirsey's estimate of 25% in the general population.

- Orientation of the 500 farm couples was likewise significantly more J (almost 70%) than is the 50-50 general population and the 33,201 base population. Males were significantly more P, while females were more J.

- A comparison of the S-N Functions shows the 1,026 farm adults to be significantly more S and less N than the base. The farm males and females do not differ significantly here. As was pointed out earlier, there are significantly more SP and NT males in agriculture than females. The same is true of sensing-thinking males. There are more NF and SF females.

- A different picture appears when comparing the T-F Functions of the 500 farm couples. About 60% of the farm adults are Thinkers, in contrast to the 50-50 split in the general population, and significantly higher than the base population. As mentioned before, the greatest contrast of all is that 78% of the farm males are T (only 22% F) while the females were 61% F and only 38% (one-half as many women as men) were T.

Conclusions, Implications and Recommendations

The findings of this study indicate that the psychological profile of these 500 farm couples is similar to that found in, and thus supports other studies of agriculturalists, Barrett and Horner (1985), Barrett and Sorenson (1985) and Horner and Foster (1985).

These findings are a key to understanding how farm couples cope with distress. A "typical" farm man is an Introverted, Sensing, Thinking, Judging type; whereas the "typical" farm woman is similar but different, she may be an Introverted, Sensing, Feeling, Judging type. The STJ and SFJ types represent 55% of the sample.

Based upon the Jungian theory of psychological typology, the profile of these farmers has these strengths: joy in decision-making and hard work, cautious and conservative. Weaknesses may be lack of positive vision and optimism for the future, anticipating the worst, unwarranted faith in hard work to solve problems and resisting change or holding to tradition beyond its usefulness.

Understanding the affect of the farm crisis on farm couples becomes clearer knowing these results. The STJ and SFJ types are the most conservative and hard working of the 16 types. They are strongly devoted to the family and its traditions. They accept the obligation and responsibility to maintain the family farm at all costs, and believe that more hard work will solve the problem. As a result of forces beyond their control, they may fail, and the result is a tremendous psychological strain on the family. This strain is much more severe for these two types because of their very make-up.

Some authors have suggested that the Thinking-Feeling (T-F) function is the area of greatest conflict in interpersonal relationships. T's may be inclined to make statements-of-fact with no intent or thought of its affect on another's feelings, while F's may wrongly interpret such a statement as an attack on them personally. This is likely to be compounded in a marital relationship simply because roughly 60% of the women in the general population are F and 60% of the men are T, even more pronounced in this sample of farm couples.

Most of us understand the value of "venting" (talking it out, sharing it with someone) in relieving stress. This is more difficult among farm couples, with such a preponderence (55%) of Introversion.

Understanding the psychological profile of agricultural people can be most helpful for the people themselves, but it can also help agricultural educators in planning strategies to be most effective for these special types of people. For example: 1) If a vocational agriculture teacher suggests changes in the farming operation of an SJ couple, due consideration should be given to the established procedures; a detailed and realistic plan should be outlined showing practical cause and effect; and risks should be minimized. 2) Workshops for vo ag instructors as "Helpers" might deal with Steps and Styles of Helping Behavior by Type such as: encouraging venting, indentifying stressors, relieving pressure and adaptation. 3) Seminars and consultations for farm couples could focus on Understanding Self and Others, Communicating Between Personality Types, and Types and Stress -- Stress Management.

It is our recommendation that agricultural educators and others working with people in agriculture become more familiar with MBTI as relates to the findings and implications of this study and others as concerning type and stress, as well as stress management. To do less will render less effective, and perhaps too late, any efforts to communicate, counsel and educate individuals, farm couples and families facing stressful situations.

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                                  TABLE 1              LEGEND: % = PERCENT OF
                                FARM ADULTS            TOTAL CHOOSING THIS GROUP
                                                       WHO FALL INTO THIS TYPE.
                                                       I = SELF SELECTION INDEX;
                                  N =  1026            RATIO OF % OF TYPE IN
                                                       GROUP TO % IN SAMPLE.
       SENSING TYPES              INTUITIVE TYPES
 WITH               WITH               WITH               WITH                           N        %        I
 THINKING           FEELING            FEELING            THINKING
-----------------------------------------------------------------------------     E     465    45.3    0.87*
! I S T J          ! I S F J          ! I N F J          ! I N T J          ! J     I     561    54.7    1.14*
!                  !                  !                  !                  ! U
!                  !                  !                  !                  ! D     S     747    72.8    1.29*
! N= 204           ! N= 121           ! N=  28           ! N=  41           ! G     N     279    27.2    0.63*
!                  !                  !                  !                  ! I
! %=19.88          ! %=11.79          ! %= 2.73          ! %= 4.00          ! N I   T     606    59.1    1.06"
!                  !                  !                  !                  ! G N   F     420    40.9    0.92"
! I= 1.57*         ! I= 1.59*         ! I= 0.74          ! I= 0.72"         !   T
!                  !                  !                  !                  !   R   J     710    69.2    1.16*
-----------------------------------------------------------------------------   O   P     316    30.8    0.77*
! I S T P          ! I S F P          ! I N F P          ! I N T P          !   V
!                  !                  !                  !                  !   E   IJ    394    38.4    1.31*
!                  !                  !                  !                  !   R   IP    167    16.3    0.88
! N=  62           ! N=  45           ! N=  34           ! N=  26           !   T
!                  !                  !                  !                  !   S   EP    149    14.5    0.67*
! %= 6.04          ! %= 4.39          ! %= 3.31          ! %= 2.53          ! P     EJ    316    30.8    1.01
!                  !                  !                  !                  ! E
! I= 1.39#         ! I= 1.21          ! I= 0.60#         ! I= 0.51*         ! R     ST    469    45.7    1.36*
!                  !                  !                  !                  ! C     SF    278    27.1    1.18#
----------------------------------------------------------------------------- E
! E S T P          ! E S F P          ! E N F P          ! E N T P          ! P     NF    142    13.8    0.65*
!                  !                  !                  !                  ! T     NT    137    13.4    0.61*
!                  !                  !                  !                  ! I
! N=  35           ! N=  39           ! N=  41           ! N=  34           ! V     SJ    566    55.2    1.38*
!                  !                  !                  !                  ! E     SP    181    17.6    1.06
! %= 3.41          ! %= 3.80          ! %= 4.00          ! %= 3.31          ! S E
!                  !                  !                  !                  !   X   NP    135    13.2    0.56*
! I= 0.79          ! I= 0.86          ! I= 0.53*         ! I= 0.61#         !   T   NJ    144    14.0    0.71*
!                  !                  !                  !                  !   R
-----------------------------------------------------------------------------   A   TJ    449    43.8    1.20*
! E S T J          ! E S F J          ! E N F J          ! E N T J          ! J V   TP    157    15.3    0.80#
!                  !                  !                  !                  ! U E
!                  !                  !                  !                  ! D R   FP    159    15.5    0.73*
! N= 168           ! N=  73           ! N=  39           ! N=  36           ! G T   FJ    261    25.4    1.09
!                  !                  !                  !                  ! I S
! %=16.37          ! %= 7.12          ! %= 3.80          ! %= 3.51          ! N     IN    129    12.6    0.64*
!                  !                  !                  !                  ! G     EN    150    14.6    0.62*
! I= 1.34*         ! I= 0.94          ! I= 0.83          ! I= 0.58*         !
!                  !                  !                  !                  !       IS    432    42.1    1.50*
-----------------------------------------------------------------------------       ES    315    30.7    1.08

    NOTE CONCERNING SYMBOLS FOLLOWING THE SELECTION RATIOS:
         "  IMPLIES SIGNIFICANCE AT THE .05 LEVEL, I.E., CHI SQ. >  3.8;
         #  IMPLIES SIGNIFICANCE AT THE .01 LEVEL, I.E., CHI SQ. >  6.6;
         *  IMPLIES SIGNIFICANCE AT THE .001 LEVEL, I.E., CHI SQ. > 10.8.

    BASE POPULATION USED IN CALCULATING SELECTION RATIO:
     CAPT FORM G TOTAL  (TT)
    BASE TOTAL N = 33201.    SAMPLE AND BASE ARE INDEPENDENT
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Personality Traits of 500 Farm Couples--Implications for Agricultural Educators During Critical Economic Conditions
A Critique

R. Lee Cole, Oregon State University -- Discussant

This study provides data that could be extremely important to those who work with Young and Adult Farmer groups. It provides information on personality type and typical responses by personality type which may be beneficial as vocational agriculture teachers encounter advising situation with this adult population.

The study makes a unique contribution to the field of knowledge. Few previous studies of agriculturalists has been done in this area. Therefore, the introduction and review of literature are necessarily short. Statements are made in the introductory paragraph, however, which should have a citation included for them.

The purpose and objectives for the study are clear and concise. Given that eight pages were allowed for the paper and only seven were used it would have been of benefit to include more information on the sample selection process, the instrument and the personality classification types.

The analysis of data and results were very straight forward. Again, a little more explanation of the personality classification types would have been helpful. There was some confusion surrounding the 16 MBTI preference types, four temperament types and the four dichotomous preference scales. The additional explanation used to clarify personality type should include an explanation of Chart A.

The highlights of tabled data were neatly done with very concise material presented. The authors are to be commended on the concise format of the results section. Care should be used to avoid the use of the word "significant" when statistical testing has not been done. Statisticians seem to be very sensitive to the use of that word.

The section dealing with conclusions, implications and recommendations was a little confusing at times. The opening paragraph needs to be reworded for clarity. At times statements were made which were very strong for the data presented.

> For example: saying that all STJ and SFJ types accept obligation and responsibility to maintain the family farm at all costs is a bit of a strong statement. I might raise the question, are there are more variables to a person's action than merely personality? Therefore it is my opinion that the language should be toned down.

The information presented about personality type and corresponding expected action should be very helpful to those working with farmers. This information would, therefore, be very important to publish for vocational agriculture teachers and extension agents. I hope the authors intend to publish in journals which find their way to these sources, in addition to publishing for teacher educators.

PROFILE OF RURAL LEADERSHIP

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INTRODUCTION

Leadership is a familiar word to ag educators, but often misunderstood. One of the principle tasks of ag educators is to be able to encourage individuals to greater heights in their personal lives and communities as a whole. The profession of ag education has been somewhat successful in developing rural leadership so that they can speak out on issues and conduct meetings effectively. In spite of these achievements, it is evident that rural leadership has a long way to go in coping with today's dynamic and ever changing society.

The problem this study attempted to address was that of identifying the psychological type profile of agricultural leaders and ask the question: are agricultural leaders of all ages similar or different from the mythical average person. And if they are the same or different, what does that say to ag educators in designing leadership programs and other rural intervention strategies.

This was a staff study beginning in the fall of 1983 and completed fall of 1985.

PURPOSES AND OBJECTIVES

The primary purpose of this study was to develop a psychological type profile of agricultural leaders and use the results to make recommendations for intervention strategies. Specifice objectives were to:

1. Determine psychological profile of established, young, youth and professional agricultural leaders in Nebraska.

2. Compare psychological profiles of agricultural leaders with the general population (Kiersey and Bates, 1978) and the base population represented by N of 33,201 Form G.

3. Compare psychological profiles of agricultural leaders between groups.

PROCEDURE

It was determined that the well-researched Myers-Briggs Type Indicator (MBTI) Form G was the most appropriate instrument for data collection. Participants in the study were administered the MBTI during workshops or in the case of 4-H, FFA, ag teachers, and established leaders, the forms were mailed.

The subjects for this study consisted of 540 agricultural leaders in Nebraska, more than 95 percent of the population sought.

The MBTI was administered to the following:

1. "Established" agricultural leaders	91
2. "Young" (age 25-40) LEAD agricultural leaders	117
3. "Young" Farmer/Rancher Educ. Assn. (local presidents)	49
4. "Youth" (FFA/4-H) State Officers	41
5. "Professional" agricultural leaders:	
Vocational Agricultural Teachers	63
Ex-Vocational Agricultural Instructors	82
Cooperative Extension Agents	97

ANALYSIS OF DATA

Individuals were classified along the following four dichotomus preference scales related to their personal orientation, how information is percieved, how decisions are made, and preferred lifestyles.

1. Personal Orientation: E-I - Extraverts (E) obtain energy from people and things. Introverts (I) gain energy from inner concepts and ideas. The E-I ratio is 75:25 in the general population as estimated by Kiersey (1978).

2. Perception: S-N - Sensing individuals (S) gather information best through the five senses. Intuitives (N) gather concepts beyond the use of the five senses. The S-N ratio is 75:25 in general population.

3. Decision Making: T-F - Thinkers (T) prefer to make decisions based on logic. Feelers (F) use a more subjective method based on values for decision making. The T-F ratio is 50:50 in the general population.

4. Lifestyle: J-P - Judging (J) individuals prefer to live by structure and order. Perceiving (P) individuals live more spontaneously. A 60:40 J-P ratio is estimated to be found in the general population.

The Chi-Square, and where necessary, Fisher's Exact Probability statistics were used to test for the presence of differences among the levels of each variable. A probability level of 5% was selected to indicate significance. The reliability of the MBTI is .85 and has been documented by many studies and described in Advances In Psychological Assessment.

The Selection Ratio Type Table (SRTT) computer program developed by Kainz (1976) was utilized to provide a convenient ratio index for comparing the distribution in percentages of types in one group with distribution found in another.

RESULTS

Succinctly, when the entire agricultural leadership sample of 540 was compared to the general population they were significantly different, there were more introverted (I), sensing (S), thinking (T) and judging (J) types (P>.001). Agricultural leadership in this sample has fewer intuitive (N), feeling (F) and perceptive (P) types (TABLE 1).

Data in Table I indicates that eight of the sixteen personality types were different from the general population, significant at the .05 level or greater. The sensing (S), thinking (T), judging (J) types represented more than one-half (52%) of the overall sample. Other characteristeics of ag leadership found was that they are more sensing (S) 74%; less intuitive (N) 26%; more thinking (T) 79%; less feeling 21%; more judging 76%; and less perceiving 24%, all at the .001 probability level.

TABLE 1. Composite Agricultural Leadership Groups
Compared to Sample of the Base Population
N=540

Personality Type	N	%	Selection Ratio	Personality Factor	N	%	Selection Ratio
ISTJ	136	25.2	1.98*	E	290	53.7	1.03
ISFJ	30	5.6	.75	I	250	46.3	0.97
INFJ	6	1.1	.30#				
INTJ	24	4.4	.80	S	398	73.7	1.30*
ISTP	24	4.4	1.03	N	142	26.3	0.61*
ISFP	6	1.1	.31#				
INFP	4	.7	.13*	T	427	79.1	1.42*
INTP	20	3.7	.74	F	113	20.9	0.47*
ESTP	26	4.8	1.12				
ESFP	14	2.6	.59"	J	411	76.1	1.27*
ENFP	11	2.0	.27*	P	129	23.9	0.59*
ENTP	24	4.4	.82		Temperaments		
ESTJ	142	26.3	2.15*	NF	43	8.0	0.37*
ESFJ	20	3.7	.49*	NT	99	18.3	0.83"
ENFJ	22	4.1	.88				
ENTJ	31	5.7	.95	SJ	328	60.7	1.52*
				SP	70	13.0	0.78"

*.001 chi-sq.>10.8; #.01 chi-sq.>6.6; ".05 chi-sq.>3.5

The most striking differences appear when examining temperament groups. It was evident which temperament groups were in ag leadership and those that were not. The sensing judging (SJ) temperament represented the most with 61% of the sample. In descending order, those temperaments with less were intuitive thinking (NT) 18%, sensing perceiving (SP) 13%, and last intuitive feeling (NF) 8%, significant at the .01 level. In the general population, SJ and SP would each account for 38% and NT and NF 12% each.

A Chi-Square analysis was used to determine if there were overall differences between the general population and the various groups of ag leaders, as well as differences among various groups. Significant differences were found, as is shown in TABLE 2. The "established" ag leader group was significantly different from the general population, as well as extension agents, vo-ag teachers, Young Farmer officers and 4-H/FFA leaders. The 4-H/FFA group was the only group that was like the general population. The youth leaders were also significantly different from vo-ag and former vo-ag teachers, professional ag leaders, and established ag leaders.

The Young Farmer officer group was significantly different from the general population, extension agents, established agricultural leaders, and former vo-ag teachers.

Vo-ag teachers were significantly different from the general population, established ag leaders and 4-H/FFA. Former vo-ag teachers were significantly different from the general population, extension agents, 4-H/FFA and Young Farmer officers.

Extension agents were significantly different from the general population, established ag leaders , Young Farmer officers, and former vo-ag teachers. In this sample, the extension agents were most similar to the vo-ag teachers.

Extension agents, vo-ag teachers and former vo-ag teachers were combined into one group as professional leaders and compared with the composite sample of ag leadership. Chi-Square analysis yielded no significant differences. The professional ag leadership group appears like the composite sample.

When vo-ag teachers were compared to a sample of 648 secondary teachers from all subjects, significant differences were found (TABLE 3). Vo-ag teachers had a greater proportion of four individual personality types: introverted, sensing, thinking, judging (30%); extraverted, sensing, thinking, judging (22%); extraverted, sensing, thinking, perceiving (6%); and extraverted, sensing, feeling, perception (5%); significant at the .05 level. Vo-ag teachers had fewer introverted, intuitive, feeling, judging (0%) and extraverted, intuitive, feeling, perceptive (0%) than the sample of secondary teachers.

TABLE 2: Comparison of Personality Types of Agricultural Leadership Groups

Group	General Pop. N=33,201	Ext. Agents N=74	LEAD N=140	Former Vo Ag Teacher N=82	Vo Ag Teacher N=63	Young Farmer Officers N=49	State 4-H/ FFA N=41
Established Ag Leader N = 91	165.50 13 0.000	24.5 14 0.039	18.8 13 0.103	14.2 13 0.358	25.3 14 0.031	27.9 13 0.009	38.9 15 0.00
4-H/FFA	11.7 12 0.467	22.5 15 0.093	20.5 15 0.261	34.7 15 0.002	27.8 15 0.022	21.7 14 0.083	
Young Farmer Officers	54.6 12 0.000	27.9 15 0.021	18.9 13 0.133	22.9 12 0.027	15.6 14 0.338		
Vo Ag Teachers	82.6 13 0.000	19.7 14 0.138	13.0 14 0.536	15.8 14 0.320			
Former Vo Ag Teachers	115.7 13 0.000	27.4 15 0.025	11.9 13 0.559				
LEAD	27.9 12 0.022	22.4 14 0.071					
Extension Agents	97.8 13 0.000						

NOTE: The top row of figures represents Chi^2 value, the second row df, and the bottom row the R-Value; $<$.05=Significance and difference.

TABLE 3. Vo-Ag Teachers Compared to a General Sample
of 648 Secondary Teachers
N=63

Personality Type	N	%	Selection Ratio	Personality Factor	N	%	Selection Ratio
ISTJ	19	30.2	2.54*	E	29	46.0	0.90
ISFJ	5	8.0	.76	I	34	54.0	1.11
INFJ	0	0.0	0.00"				
INTJ	2	3.6	0.59	S	52	82.5	1.67*
ISTP	19	4.8	3.09	N	11	17.5	0.35*
ISFP	1	1.6	0.64				
INFP	1	1.6	0.25	T	49	77,8	1.85*
INTP	3	4.8	1.62	F	14	22.2	0.38*
ESTP	4	6.4	5.88"				
ESFP	5	8.0	3.43"	J	43	68.3	1.00
ENFP	0	0.0	0.00#	P	40	31.7	1.00
ENTP	3	4.8	1.34		Temperaments		
ESTJ	14	22.2	1.97"	NF	2	3.2	0.09*
ESFJ	1	1.6	0.19	NT	9	14.3	0.88
ENFJ	1	1.6	0.18				
ENTJ	1	1.6	0.37	SJ	39	61.9	1.47#
				SP	13	30.6	2.79*

*.001 Chi-Sq.>10.8; #.01 Chi-Sq.>6.6; ".05 Chi-Sq.>3.5

The vo-ag teacher sample had a greater percentage of sensing (S) types (83%) compared to only 17% intuitive (N). A greater number of thinking (T) types (78%) and less feeling (F) types 22%; significant at the .001 level. The temperament groups were also different from the general secondary teacher sample. There were more sensing-judging (SJ, 62%), and sensing-perceiving (SP, 21%) and less intuitive-feeling (NF, 3.2%); significant at the .001 level. This finding is similar to that of Foster and Horner (1985) who found a high percentage of sensing types in agricultural teacher educators nationally. Plessman (1985) also found, in a nationwide study of marketing teachers, a high percentage of sensing-judging types.

Young Farmer officers and LEAD Fellows were combined into a Young Leadership Group and compared to the composite leadership sample. The Young Leadership Group had a few significant differences. Two personality types had significantly more representation than the composite leadership sample. They were: introverted (I), sensing (S), thinking (T), perceptive (P), and extraverted (E), intuitive (N), thinking (T), perceptive (P). This group also had more perceptive (P) types, significant at the .001 level. The most noteworthy difference in this group of young leaders was in the temperament groupings. Sensing-judging (SJ), which dominates the other groups, was less, and intuitive-thinking (NT) was more, significant at the .05 level.

Results of a comparison of the youth-leaders (4-H/FFA) with the composite group is shown in Table 4. The introverted (I), sensing (S), thinking (T), judging (J) type that is so heavily represented in all the adult leader groups is less in the youth group, significant at the .05

level. Two intuitive types: extraverted (E), intuitive (N), feeling (F), perceptive (P), and extraverted (E), intuitive (N), feeling (F), judging (J) were more heavily represented, significant at the .01 level. This group was also more extraverted and more feeling. Significant differences were found in the temperament groups. There were more intuitive-feeling and less sensing-judging.

The last group to be compared with the composite leadership group was the established recognized leaders. One personality type clearly dominated. It was the extraverted (E), sensing (S), thinking (T), judging (J) type, 40% of the sample, significant at the .01 level. The introverted (I), sensing (S), feeling (F), judging (J) type was least represented. Established, recognized leaders had more thinking (T) 88% and less feeling (F) 12%, significant at the .05 level, than the composite group. The most outstanding difference with this group was that judging (J) types represented 90% of the group and perception (P) only 10%, significant at the of the sample and the sensing-perceiving (SP) was least, significant at

TABLE 4. Personality Types of State FFA/4-H Leaders
Compared With the Composite Ag Leadership Sample
N=41

Personality Type	N	%	Selection Ratio	Personality Factor	N	%	Selection Ratio
ISTJ	4	9.8	.39"	E	29	70.7	1.32"
ISFJ	4	9.8	1.76	I	12	29.3	0.63"
INFJ	1	2.4	2.20				
INTJ	0	0.0	0.00	S	25	61.0	0.83
ISTP	1	2.4	0.55	N	16	39.0	1.48
ISFP	1	2.4	2.20				
INFP	1	2.4	3.29	T	19	46.3	0.59*
INTP	0	0.0	0.00	F	22	53.7	2.56*
ESTP	3	7.3	1.52				
ESFP	2	4.9	1.88	J	28	68.3	0.90
ENFP	4	9.8	4.79#	P	13	31.7	1.33
ENTP	1	2.4	0.55		Temperaments		
ESTJ	7	17.1	0.65	NF	12	29.3	3.68*
ESFJ	3	7.3	1.98	NT	4	9.8	0.53
ENFJ	6	14.6	3.59*				
ENTJ	3	7.3	1.27	SJ	18	43.9	0.72"
				SP	7	17.1	1.32

*.001 Chi-Sq.>10.8; #.01 Chi-Sq.>6.6; ".05 Chi-Sq.>3.5

SUMMARY/CONCLUSIONS AND IMPLICATIONS

In summary, an analysis of the findings of this study indicates that agricultural leadership as a whole is significantly different from the general population. Extension agents and vo-ag instructors, as a group, are not very different from the typical ag leader. The established, recognized agricultural leader group and the statewide youth group were least typical of agricultural leaders.

The personality type profile of agricultural leadership, as represented in this sample of 540, is not similar to the general population. The preponderence of the sensing-judging (SJ) temperament over all others (61%) is noteworthy. Typically only 38% would be found. As a group, SJ's are cautious and like to minimize risks. They like to organize, are good with details, and find the typical business setting and bureaucracy to their liking. According to Kiersey and Bates (1978), SJ's attract other SJ;s and may have communication problems with those personality types not similar to their own.

One may predict that vo-ag teachers would have a different personality profile from general secondary teachers, and that is what was found. A high percentage of sensing-judging (SJ) types and sensing-perceiving types were found with few intuitives (N). These differences from the general secondary teacher may be some of the reasons vo-ag teachers find themselves and their program somewhat isolated from other teachers. It also helps to explain why vo-ag teachers are more interested in learning practical skills rather than teaching strategies. The conservative nature of sensing types may also help explain the resistance to change that many vo-ag teachers seem to exhibit.

The job of the agricultural leader involves meeting many publics, and having so high a number of introverts, who usually find communicating more difficult than extraverts, could be a problem. On the other hand, the high percentage of sensing types (70%) is typical of a rural clientele (Horner and Barrett, 1986). The SJ in particular is good at putting other's ideas into practice and that fits with the extension-education mission of dissemination.

Another factor that may cause some problem with the agent and teacher group and their clientele, is the high percentage of thinking types (73%) compared to feeling. Feeling types, which are represented less in this sample, usually find people relationships easier to establish and maintain than thinkers.

Several final implications for this heavy STJ agricultural leadership group is that they will be loyal and dedicated to the people they serve and get a lot of work done, but they may also be rather closed to change and ideas that don't make sense to them.

The younger agricultural leaders have several radical differences in personality type profile. First, they have less concern for organization and "duty" than the other groups. Second, they are more future oriented, more intuitive than the composite group of leaders. Third, the high percentage of intuitive thinkers (NT) may mean they may "push the system" to get needed changes.

The state level youth leadership group was the only group to be similar to the general population. Several factors about this group that may have leadership significance. This group is more extraverted, more intuitive and more feeling than other groups. Myers (1980) notes that the ENF types find communication easiest and are attracted to new situations and challenges. The findings of this study raises an interesting question: Why don't these ENF types stay in ag leadership? One possibility, is that they do not see the diversity of agriculture, or they see agriculture as being dull.

The recognized, established agricultural leadership group has the least diversity of personality types. They are primarily STJ's. This group may be characterized as "hard nosed and driving". These leaders find analysis of cause and effect easy, but must work hard at maintaining personal relationships. This group, like the agricultural educators, will tend to prefer to work with known skills and may resist change.

In sum, agriculture leadership, as is represented in this sample of 540, may be characterized as conservative, hard working, highly logical, may prefer to work alone, likes to maintain things as they are, and does not adapt quickly to changing times.

Understanding the psychological profile of agriculture leaders can help agricultural educators at all levels to understand and be able to determine future planning and educational strategies that will be most effective for all types of people. As an example, when teacher educators plan to impact change with the typical agricultural leader, consider the following procedure: 1. reduce the risk of the change strategy, 2. detail the plan in realistic terms, outlining cause and effect, and 3. give due consideration to the traditional way of doing things.

To ignore the findings of this study in planning educational intervention strategies is to cause change to be minimal, and often inappropriate for the situation.

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Profile of Rural Leadership
A Critique

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The study conducted by Barrett and Horner was very interesting. Agricultural leadership development has long been a goal of vocational agriculture programs at the secondary, post-secondary, and adult levels. It is particularly noteworthy that these researchers have begun to examine personality factors that distinguish agricultural leaders.

Some of the major strengths of the study were:

1. The purpose of the study was clearly defined and addressed a topic of importance to many agricultural educators.
2. Objectives were developed to guide and direct the research effort.
3. The study utilized an extensively tested instrument for data collection which added to the credibility of the research.
4. Achievement of a 95 percent response rate was commendable.
5. Data analysis techniques employed appeared to be appropriate to fulfull the objectives outlined in the study.

In reviewing the research paper, several questions emerged which inhibited a fuller understanding of the findings. Some of the major concerns were:

1. Can you provide the reader with some assurance that the data collection instrument was valid for the purpose of the study?
2. Did you provide the reader with a psychological profile of the four groups of agricultural leaders as described in objective one?
3. How were the groups which were identified for data collection pruposes related to the groups identified for data analysis and reporting purposes?
4. Why is there a discrepancy in the number of respondents in both the extension agent and LEAD fellow groups and the N reported for each group in Table 2?
5. How did the comparison of the vocational agriculture teacher group with the general sample of secondary teachers serve to fulfill the objectives of this study?
6. Why were data (i.e. a table) not provided comparing the Young Leadership Group (i.e. Young Farmer officers and LEAD fellows) with the composite leadership sample?
7. How should the reader interpret the selection ratios which were provided in the tables?

It was a pleasure to have the opportunity to review this research effort. Further studies in this area would be beneficial as the profession strives for a greater understanding of factors related to agricultural leadership.

REASONS WHY MINNESOTA COUNTY AGENTS WITH FIVE OR MORE YEARS OF EXPERIENCE REMAIN IN THE PROFESSION

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INTRODUCTION

The mission of the Minnesota Agricultural Extension Service is to provide education-oriented programs to aid in support of the people throughout the state. The cutting edge of this organization centers upon the county extension agents in each county of the state. The delivery of these programs can be extremely demanding and challenging. Ever-changing clientele needs challenge agents to continually expand upon their knowledge base and competencies. The profession involves a wide range of responsibilities and expectations. Specific responsibilities vary from county to county and individual to individual.

There is an important need in Extension, as well as other organizations, to more fully understand the factors involved in job satisfaction and job retention. Most educational organizations, including Extension, have problems in recruiting, securing, and keeping professionals. Orientation and training of new professionals involves much time, effort, and money. If the factors for remaining in Extension can be further identified, it may be possible to keep professional turnover at a minimum by recognizing and emphasizing the positive factors. A better understanding of these influences may also help the individual agent to analyze his or her own personal situation. Recognizing that there are indeed positive reasons to remain in the profession may help to improve morale and job retention.

According to Giegold and Skelton (1976):

> Job satisfaction and good morale are continuing objectives of administrators in all organizations, and Extension is no exception. Poor morale, recognized or not, contributes to increased personnel turnover, lower effectiveness, and most importantly, an intensified struggle to stay fully staffed.

Related Studies

Several studies help to provide the theoretical framework for studies regarding vocational satisfaction. These include efforts by Holland (1973), Scarpello and Campbell (1983), and Chapman (1983).

Job satisfaction studies concerning Cooperative Extension Service personnel have been conducted by Moore (1967), Sappington (1972), Worden (1975), Giegold and Shelton (1976), Milliken and Whaples (1978), and Kittrell and McCracken (1983).

Studies examining stress in Cooperative Extension work have been emphasized recently. These include works by Fetsch, Flashman and Jeffiers (1984) and Patterson and McCubbin (1984).

The studies referred to here were generally not concerned extensively with factors influencing workers to remain in the profession. The study described in this paper was conducted to identify the major positive factors influencing job retention.

PURPOSE AND OBJECTIVES

The primary purpose of this research was to identify the major reasons why Minnesota county extension agents with five or more years of extension experience as of February, 1986, remained in the profession.

The specific objectives of the study were:

A. To determine the level of influence a selected list of factors might have had on the decision of Minnesota county extension agents with five or more years of extension experience to remain in Extension.

B. To compare the relative influence of selected factors among tenure groups of county extension agents.

C. To compare the relative influence of selected factors among program area groups--4-H, Agriculture, and Home Economics/Family Living.

PROCEDURE

The population for this study consisted of the 159 Minnesota county extension agents with agriculture, home economics/family living, and 4-H responsibilities who had five or more years of extension experience as of February, 1986. The entire population was surveyed.

The direct mail survey method was used. A questionnaire was developed which was similar to that used by Olson (1979) in his study of North Dakota Vocational Agriculture teachers. The instrument was review by state Cooperative Extension staff in North Dakota and Minnesota and was pilot tested by 12 North Dakota county extension agents.

The survey form was first sent on February 28, 1986, and one follow-up mailing was made on March 14, 1986. This resulted in 151 usable returns for a rate of 95%.

DATA ANALYSIS

The instrument contained a list of 39 factors which might influence an extension worker to remain in his/her profession. Respondents were asked to rate these factors as having: very much influence; much influence; some influence; little influence; or no influence on their decision to remain in the profession. These influence levels were given numerical values of 5, 4, 3, 2, and 1 respectively.

Responses for each questionnaire item were compiled and tabulated using an IBM PC and the StatPac statistical analysis software program. Mean scores, mean score rankings, and standard deviations were calculated for each influence factor by the total group, by agent program areas, and by agent tenure groups.

One-way analysis of variance was used to test for significant differences between responses from the three agent program areas: agriculture, home economics/family living, and 4-H. One-way analysis of variance was also used to test for significant differences in responses between agent tenure groups. Agents were divided into three tenure groups: 5-10 years, 11-19 years, and 20-40 years of total extension experience. For those influence factors with an F ratio of $p<.05$, multiple comparison t tests were run to determine which differences between means were significant.

RESULTS

Data presented here illustrates the ratings and rankings of the influence factors by the total group. Comparisons of the factor ratings by program areas and tenure groups are also shown here.

Ratings and Ranking of Selected Factors by Total Group

Generally, those factors which dealt with service to others ranked much higher than those which were related to personal benefit. The results of this survey (Table 1) were very similar to the study of vocational agriculture teachers by Olson (1979).

The top ranking influence among extension agents was "opportunity to serve others in a meaningful way" with a mean score of 4.42. Among vocational agriculture teachers, this same factor was rated third (Olson, 1979). Both agriculture teachers and extension agents ranked "opportunity to innovate and vary type of work being done" as second. The mean score for this factor was 4.40. The other factors with mean scores of more than 4.00 and a level of influence of much to very much were: "working closely with people" (4.37), "enjoy working in my program area" (4.36), "feeling of personal accomplishment" (4.35), "job is challenging" (4.27), "enjoy teaching adults and youth" (4.25), "feeling that my work is a valuable contribution to my community" (4.12), and "personal commitment to the mission of extension" (4.04).

The group of 19 factors with mean scores ranging from 3.05 to 3.97 were also perceived by agents as having a significant influence upon their decision to remain in the profession. These factors had some to much influence.

The group of 10 factors with mean scores of 2.00 to 2.97 had little to some influence. It is interesting to note that "opportunity for advancement" (2.47) and "job security" (2.91) ranked very low in comparison to many other factors. This does not mean that these factors are not important in job retention. If opportunities for advancement were to increase, it is likely this factor would be rated higher. "Job security" may also have ranked higher if it weren't for the cutbacks in funding and proposed staffing changes at the time of the study.

The lowest rated factors by the total group included: "support and encouragement from district program leaders" (2.43), "spouse's employment" (2.39), "merit evaluation" (2.10), "free time available to spend with family, friends, or self" (2.00), and "closeness to parents' or spouse's parents' home" (1.90). Again, it is important to note that just because these factors received low mean scores does not mean they are not important to job retention. Each of the 39 factors had at least four individuals who rated it as having very much influence in their decision to remain in the profession. Therefore, each of the factors was important under certain individual circumstances.

Table 1--RATINGS AND RANKINGS OF SELECTED INFLUENCE FACTORS BY TOTAL GROUP

Factors are listed in order of rank of total group.	N	M	SD
1. Opportunity to serve others in a meaningful way.	151	4.42	.64
2. Opportunity to innovate and vary type of work being done.	151	4.40	.68
3. Working closely with people.	150	4.37	.75
4. Enjoy working in my program area.	151	4.36	.72
5. Feeling of personal accomplishment.	151	4.35	.68
6. Job is challenging.	150	4.27	.74
7. Enjoy teaching adults and youth.	151	4.25	.80
8. Feeling that work is a valuable contribution to community.	151	4.12	.79
9. Personal commitment to the mission of Extension.	151	4.04	1.00
10. Opportunity to observe growth and development in clientele.	151	3.97	.77
11. Clientele interest in the program.	150	3.87	.82
12. Flexible schedule.	150	3.83	.97
13. Rapport with other agents in my own program area.	151	3.76	.91
14. Inservice/staff development opportunities.	150	3.73	.94
15. Felt best trained in this area.	151	3.64	.98
16. Opportunities for continuing education/graduate study.	151	3.52	1.07
17. Association with the Univ. of Minn. as a faculty member.	151	3.47	1.12
18. My community's quality of life.	148	3.46	1.03
19. Community attitudes toward extension.	150	3.35	.96
20. Feeling of being a part of the organization.	151	3.31	.95
21. Rapport with agents in other program areas than my own.	151	3.27	.97
22. Professional relationships with others in my county office.	151	3.26	1.07
23. Working conditions/physical environment.	150	3.15	1.00
24. Prestige of my position	151	3.14	1.07
25. Community responsibilities.	149	3.13	1.03
26. Recognition for doing a good job.	149	3.08	.90
27. Salary appropriate to job expectations.	150	3.06	1.03
28. Retirement benefits.	151	3.05	1.09
29. Health benefits.	147	2.97	1.07
30. Support and encouragement from county extension committee.	150	2.97	1.13
31. Own my own home.	134	2.94	1.38
32. Job security.	148	2.91	1.08
33. Lack of alternative employment opportunities.	147	2.73	1.36
34. Opportunity for advancement.	148	2.47	1.01
35. Support and encouragement from district program leaders.	150	2.43	1.13
36. Spouse's employment.	121	2.39	1.46
37. Merit evaluation.	151	2.10	1.12
38. Free time available to spend with family, friends, or self.	143	2.00	1.09
39. Close to parents' or spouse's parents' home.	136	1.90	1.23

Ratings and Comparisons of Selected Factors by Program Areas

Ratings of the influence factors were compared by program area (Table 2). Only those factors showing significant differences were included. There were 63 Agriculture agents, 49 Home Economics/Family Living agents, and 39 4-H agents. Those with responsibilities in more than one area were classified according to area of major responsibility.

Significant differences were found for 10 of the 39 influence factor responses when compared by program areas. The following are the 10 factors where differences were found:

1. Agriculture agents ranked "opportunity to serve others in a meaningful way" significantly higher than did 4-H agents. It should be noted that, even though there was a significant difference in response, all program areas rated this factor very high with a mean score of 4.23 or higher.

2. Home economics/family living agents ranked "enjoy teaching adults and youth" higher than either Agriculture or 4-H agents. This may seem logical as HE/FL agents have traditionally conducted more formal presentations. Agriculture agents may have dealt more with individual consultation and the use of specialists for programs. 4-H may have been viewed as more activity-oriented. It is possible that the term "teaching" in this case was interpreted as being teaching in the more formal sense of the word. It should also be noted here that this factor was rated very high by all three program areas with a mean score of 4.10 or higher.

3. 4-H agents ranked "clientele interest in the program" higher than either Agriculture or HE/FL agents. This difference may reflect the fact that the 4-H program may be one of the most visible parts of the extension program. 4-H has traditionally had relatively high interest by clientele in most counties in comparison to other program areas.

4. Both HE/FL and 4-H agents ranked "flexible schedule" higher than did Agriculture agents.

5. HE/FL agents ranked "inservice/staff development opportunities" higher than did either Agriculture or 4-H agents.

6. HE/FL agents ranked "salary" significantly higher than Agriculture agents. It is possible this difference may be due to the fact that in past years HE/FL agents, who are generally women, may have been relatively higher paid in this profession than they may have been in another profession.

7. HE/FL agents ranked "health benefits" higher than did Agriculture agents. This difference may be due to a higher value and concern for family health and maternity leave policy by HE/FL agents.

8. 4-H and HE/FL agents ranked "lack of alternative employment opportunities" significantly higher than Agriculture agents.

9. HE/FL and 4-H agents both ranked "support and encouragement from district program leaders" higher than did Agriculture agents.

10. Both HE/FL and 4-H agents valued "spouse's employment" higher than did Agriculture agents. There was a greater difference for this facter with an F score of 23.33 than any other. It may be that HE/FL agents have, due to traditional female roles, experienced a greater limitation to job transition because of their spouse's employment. 4-H agents, consisting of a higher percentage of women than Agriculture agents, may also have experienced this influence.

Table 2--RATINGS AND COMPARISON OF FACTORS BY TOTAL GROUP AND PROGRAM AREAS**

	TOTAL GROUP				AGRICULTURAL AGENTS				HE/FL AGENTS				4-H AGENTS				*P<.05
Factors listed in order of rank for total group.	N	Rank	M	SD	N	Rank	M	SD	N	Rank	M	SD	N	Rank	M	SD	F Value
Opportunity to serve others in a meaningful way.	151	01	4.42	0.64	63	01	4.56	0.59	49	02	4.41	0.61	39	05	4.23	0.71	3.25*
Enjoy teaching adults/youth.	151	07	4.25	0.80	63	09	4.10	0.82	49	01	4.53	0.58	39	08	4.15	0.93	4.67*
Clientele interest in the program.	150	11	3.87	0.82	63	11	3.86	0.82	49	16	3.63	0.78	38	06	4.21	0.78	5.65*
Flexible schedule.	150	12	3.83	0.97	63	14	3.60	0.96	48	11	3.98	0.93	39	11	4.03	1.04	3.07*
Inservice/staff development opportunities.	150	14	3.73	0.94	62	13	3.63	0.87	49	10	4.02	0.85	39	15	3.51	1.07	3.88*
Salary appropriate to job expectations.	150	27	3.06	1.03	63	31	2.73	1.05	49	19	3.45	0.87	38	24	3.10	1.03	7.32*
Health benefits.	147	29	2.97	1.07	63	31	2.73	1.02	45	30	3.04	1.04	39	20	3.28	1.12	3.45*
Lack of alternative employment opportunities.	147	33	2.73	1.36	62	34	2.27	1.24	46	24	3.26	1.27	39	34	2.85	1.42	7.77*
Support and encouragement from district program leaders.	150	35	2.43	1.13	63	35	2.14	1.08	49	35	2.65	1.11	38	35	2.63	1.17	3.71*
Spouse's employment.	121	36	2.39	1.46	59	39	1.59	0.95	39	26	3.20	1.51	23	29	3.04	1.43	23.53*

Table 3--RATINGS AND COMPARISON OF FACTORS BY TOTAL GROUP AND AGENT TENURE GROUPS**

	TOTAL GROUP				GROUP A (5-10 YRS.)				GROUP B(11-19 YRS.)				GROUP C(20-24 YRS.)				*P<.05
Factors listed in order of rank for total group.	N	Rank	M	SD	N	Rank	M	SD	N	Rank	M	SD	N	Rank	M	SD	F Value
Feeling of being a part of the organization.	151	20	3.31	0.95	52	21	3.12	1.00	52	24	3.21	0.92	47	17	3.64	0.87	4.33*
Professional relationships with others in my county office.	151	22	3.26	1.07	52	30	2.90	1.12	52	17	3.60	1.00	47	24	3.28	0.99	5.76*
Retirement benefits.	151	28	3.05	1.09	52	32	2.81	1.12	52	29	2.86	0.95	47	19	3.53	1.06	7.20*
Job security.	148	32	2.91	1.08	50	33	2.76	1.17	52	32	2.77	1.00	46	27	3.24	0.99	3.18*
Spouse's employment.	121	36	2.39	1.46	40	31	2.88	1.50	43	35	2.60	1.47	38	39	1.63	1.10	8.78*

**Only factors with significant differences included in Tables 2 and 3.

Ratings and Comparison of Selected Factors by Agent Tenure Groups

Responses of the agents were also compared by tenure groups based on total years experience in the extension profession. All agents were divided into three tenure groups - Group A (5-10 years of experience), Group B (11-19 years), and Group C (20-40 years). Groups A, B, and C consisted of 52, 52, and 47 agents respectively.

Very little difference in response by tenure groups was found for most of the factors. Significant differences were found for 5 of the 39 factors. Those factors were:

1. Group C ranked "feeling of being a part of the organization" higher than either Group A or Group B. It seems to be logical that the longer a person is a member of an organization the more he is likely to feel that he is an important part of the organization.
2. Group B ranked "professional relationships with others in my county office" higher as an influence than did Group A. It may be that this difference is due to friendships and professional relationships developing and existing over a longer period of time; the longer agents work together, the more value they see in their relationships.
3. Group C ranked "retirement benefits" significantly higher than did either Group A or Group B. This difference seems logical since agents with more years of service are generally older and closer to retirement age; therefore, this factor is more important to them.
4. Group C ranked "job security" higher than either of the other two groups. It seems likely that agents with more years of serice would place a higher value on job security the closer they are to retirement since the desire and/or ability to find alternative employment decreases.
5. Group A and Group B both ranked "spouse's employment" as having more influence than did Group C. This could be due to the fact that agents with fewer years of service tend to be less established, tend to have younger families, and tend to be more dependent on two incomes.

CONCLUSIONS

Based on the observations of the study, the following conclusions have been drawn:

1. County extension agents who have remained in the profession for five or more years are generally very dedicated professionals. Those agents derive satisfaction from serving others in a meaningful way. In general, agents feel that their work is a very important and valuable contribution to their communities.
2. Intangible type job benefits were also very important influences in agents' decision to remain in the profession. These factors included: opportunity to innovate and vary the type of work being done, opportunity to work in their own program area, feeling of personal accomplishment, rapport with other agents, and challenging aspects of the profession.

3. Tangible type job benefits were also very important influences on decisions to remain in the profession. Opportunity for personal and professional development, flexible schedule, salary, and retirement benefits had at least some to much influence.

4. Factors which related to recognition and support and family appeared to have had less influence in their decisions to remain in the profession.

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Reasons Why Minnesota County Agents With Five or More Years of Experience Remain in the Profession

Clifford L. Nelson, Washington State University - Discussant

The study of potential turnover in a dynamic organization such as *Extension is of value. The identification of positive factors that keep* people in the profession can also be useful to supervisors and administrators. The theoretical background and literature identified in the paper enhance the value of the study.

An extension agent with more than 5 years in the system is valuable to study since normal performance reviews will have separated the majority of the unsuccessful. Most university final tenure decisions are completed before the 7th year of employment. Five years is usually enough time, for those who don't find extension satisfying, to find another profession. The economic realities of public employment are also usually clear to the individual within the first 5 years of employment.

The response rate to the survey was excellent. However the instrument reliability was not readily ascertainable. Statistical treatment was appropriate for the data collected.

Previous studies of extension personnel and other agricultural education professionals have shown that the groups become more homogeneous over time. This appears to have happened more rapidly in the case of this study. The present study does not show the differences in morale found in earlier studies reported in the literature review. Perhaps this is because of the current state of the economy particularly in the agricultural sector. There might be less opportunity in business and farming for the current extension agent. Studies such as this should be replicated over time. They give very useful information to administrators and those who employ agents.

Relationships of Student Perceptions of Classroom Learning Environment Factors

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INTRODUCTION

One of the roles of the Agricultural Education Department is to improve all instruction within the College of Agriculture at the University of Nevada-Reno (UNR). The primary objective of this investigation is to provide information that will improve teaching effectiveness within the College of Agriculture. This investigation represents an compilation of data that will ultimately be used in a complete, systematic approach toward improving college faculty instruction. The relative impact of this study is to provide information and feedback to faculty regarding student perceptions of the learning environment.

The theoretical framework of this investigation was derived from a model of classroom learning developed by Mitzel and presented by Dunkin and Biddle (1974). This model describes student learning as a product outcome of the classroom learning environment. The learning environment involves an interaction of variables relating to the student, the teacher, and the school.

PURPOSES AND OBJECTIVES

The primary purpose of this study was to investigate the effect of selected variables on teaching effectiveness and classroom learning. The specific objectives were to:

1. Determine the relative degree to which selected classroom situations have an impact upon the learning environment as perceived by students;

2. Determine if significant relationships exist between student perceptions of instructors and selected variables that may affect classroom learning;

3. Determine if significant relationships exist among student perceptions of variables that may affect the classroom learning environment.

PROCEDURES

A survey instrument was developed by the investigators based on a study completed by Perkins (1977) at Mississippi State University. The instrument was designed to elicit appropriate demographic information and Likert type responses to 31 variables which the investigators believed had an impact on the classroom learning environment. The variables were grouped into the following categories: student personal concerns, classroom problems, presentation variables, methodology, and evaluation variables. The instrument also included variables which rated the instructor and provided an overall course rating based upon the instructor, course content, subject matter usefulness and teaching methods. The instrument was developed in 1984 and field tested in three fall semester classes. Several modifications were made as a result of the testing.

Reliability for the instrument was determined using Cronbach's alpha coefficient which measures internal consistency. The obtained reliability coefficients for each of the variable groups is reported in Table 1. Cronbach's alpha was selected as the most appropriate method because it can be accomplished in one shot and provides a conservative estimate of the reliability of an instrument. (Carmines & Zeller, 1979).

Table 1

Cronbach Alpha Reliability Coefficients of Classroom Learning Environment Factors

Environment Factors	Number of Variables	n	Cronbach Alpha
Personal Variables	5	169	.71
Classroom Variables	9	166	.80
Presentation Variables	6	168	.68
Methodology Variables	7	151	.74
Evaluation Variables	4	162	.80
Course Rating Variables	4	151	.91

Ten instructors were randomly selected for this study from the College of Agriculture during Fall Semester, 1985 and Spring Semester, 1986.

ANALYSIS OF DATA

Data were collected from 171 students enrolled in undergraduate classes in the College of Agriculture. Demographic data were summarized using descriptive statistics. Means were calculated for the 31 variables which the investigators believed might have an impact on classroom learning. Pearson Product-Moment correlations were computed to determine if significant relationships existed between selected variables.

RESULTS

Objective one was designed to determine the degree to which selected variables have an impact on the classroom learning environment. As presented in Table 2, the variables are divided into five categories: student personal concerns; classroom problems, presentation variables, methodology, and evaluation variables.

Of the student personal concerns, none appeared to have a major degree of influence. However, of the reported variables, lack of sleep and poor grades had the highest means. None of the variables in the classroom category were of a major influence.

When asked about teacher presentation techniques, students generally felt that teachers spoke loud enough and were distinct. However, students indicated that instructors who spoke too fast were a slightly greater concern than those who spoke too slow. The variables under teaching methodology demonstrated the greatest degree of variability. Students responded that instructors used some form of visual aids only about half the time. However, these visual aids usually improved the students' understanding of the instructional material. They also felt that instructors were almost always well prepared and summarized points adequately. Also, the presentations were usually interesting to the students.

In the area of evaluations, students perceived that teachers almost always were fair and that evaluations were well defined. Whereas tests were generally perceived to enhance learning, outside assignments were not quite as highly rated.

Objective two sought to determine if significant relationships existed between student perceptions of instructors on selected variables that may affect classroom learning.

Table 3 reports the relationships of the students' perceptions of the instructor to each of the five categories of classroom learning environment variables and a composite overall course rating. As indicated in Table 3, a significant relationship does not exist between the students' perceptions of

Table 2

Summary of Student Perceptions to Classroom Learning Environment Variables

Variables	n	Mean[a]	SD
Student Concerns			
Health	170	1.78	1.45
Lack of Sleep	170	2.60	1.80
Financial Worries	170	2.05	1.83
Poor Grades	170	2.50	1.94
Lonesomeness	169	1.45	1.27
Classroom Problems			
Too Warm	168	2.41	1.75
Too Cold	169	2.71	1.92
Inside Noise	169	2.31	1.71
Outside Noise	168	2.76	1.82
Lights Too Bright	168	1.52	1.12
Lights Too Dim	169	1.70	1.40
Seats Uncomfortable	166	2.80	2.08
Poorly Arranged	167	2.13	1.74
Can't Read Board	167	2.59	1.83
Presentation			
Speaks Loud Enough	170	6.41	1.08
Speaks Distinctly	169	6.28	1.12
Speaks Too Fast	168	3.05	1.98
Speaks Too Slow	169	2.41	1.58
Correct Vocabulary	170	2.63	1.74
Offending Mannerism	170	1.57	1.27
Methodology			
Visual Aids Used	170	4.14	2.16
Visual Aids Improved Understanding	151	4.97	1.96
Questions Were Encouraged	170	5.76	1.50
Presentations Were Interesting	168	5.21	1.41
Handhouts Were Used	167	5.08	1.49
Instructor Was Well Prepared	168	6.26	1.05
Points Summarized	168	5.87	1.38
Evaluation			
Evaluation Was Well Defined	167	6.05	1.26
Evaluation Was Fair	169	6.09	1.23
Tests Enhanced Learning	166	6.39	1.00
Outside Assignments Enhanced Learning	162	5.63	1.69

[a] NOTE:

1 = Never
2 = Almost Never
3 = Seldom
4 = About Half The Time
5 = Usually
6 = Almost Always
7 = Always

Table 3

Pearson Correlations of Student Perceptions of the Instructor and Classroom Learning Environment Factors

		Factors					
Criteria	Instructor Rating	Personal	Classroom	Presentation	Methodology	Evaluation	Course Rating
Instructor Rating	1.00						
Factors							
Personal	.06	1.00					
Classroom	-.06	.65**	1.00				
Presentation	-.03	.51**	.45**	1.00			
Methodology	.70**	-.05	-.06	.14*	1.00		
Evaluation	.58**	-.20**	-.10	.17*	.66**	1.00	
Course Rating	.55*	.39**	.39**	.54**	.49**	.39	1.00

* = p<.05
** = p<.01

the instructor and the student personal variables or to classroom variables. Also, there does not appear to be a significant relationship between how the students rated the instructor and the instructor's manner of presentation. However, a very high relationship does exist between the students' rating of the instructor and the students' perceptions of the teaching methodology used (r=.70;p<.01). Furthermore, a high relationship (r=.58;p<.01) exists between the instructor rating and the students' perceptions of the evaluations techniques which were used. A high positive relationship also exists between the instructor rating and the overall course rating.

In addition, Table 4 indicates the Pearson correlation coefficients of the students' course ratings. This table indicates that very strong positive relationships exists between the students' ratings of the instructor and a rating of course contest (r=.70;p<.01) as well as the teaching methods (r=.89;p<.01). Also, a strong relationship exists between the instructor rating and the subject matter usefulness rating (r=.61;p<.01).

Table 4

Pearson Correlations of Course Rating Variables

	Content	Instructor	Usefulness	Methods
Content	1.00			
Instructor	.70*	1.00		
Usefulness	.82*	.61*	1.00	
Methods	.76*	.89*	.69*	1.00

* = p<.01

Objective three sought to determine if significant relationships existed between student perceptions of variables that may affect the classroom learning environment.

Pearson correlation coefficients for the categories of variables are shown in Table 3. Personal variables were shown to have a significant relationship with classroom variables (r=.65;p<.01) and presentation variables (r=.51;;p<.01). However, no significant relationship was found with teaching methodology and a low negative relationship was found with evaluation variables (r=-.39;p<.01). Also, a positive relationship was found between personal variables and the overall rating of the course (r=.39;p<.01).

The classroom variables did not have a significant positive relationship with the presentation variables (r=.45;p<.01). However, no significant relationship was found between the classroom variables and teaching methodology or evaluation variables. There was a positive relationship between the classroom variables and the overall course rating (r=.54;p<.01).

The teaching methodology variables had a strong positive relationship with the evaluation variables (r=.66;p<.01). Furthermore, the evaluation variables had a positive relationship with the overall course rating (r=.39;p<.01).

Table 4 also indicated that there was a strong relationship between how students perceived course content and subject matter usefulness (r=.82;p<.01) and teaching methodology (r=.69;p<.01) ratings. Furthermore, the students' rating of the teaching methods had a strong relationship with the subject matter usefulness (r=.69;p<.01).

CONCLUSIONS AND RECOMMENDATIONS

Based upon the stated objectives and the results of this investigation, the following conclusions and recommendations have been made.

Student personal concerns appear to have only a limited impact on the classroom learning environment. It seems as though only where student personal concerns may reach an extreme, do they have a significant impact on the students' perceptions of the learning environment.

It appears as though the actual classroom setting does not have an impact on the learning environment unless the classroom setting is extreme. It appears that if the instructor provides reasonable lighting, comfort, and climate the students will adapt.

Based upon the findings of this study, the key to the learning environment is indeed the instructor. High relationships exist between the instructor rating and the course content as well as subject matter usefulness. It appears as though the students perceive the teacher s being the single, most important aspect of having a worthwhile course. All teachers should take note that of all the sets of variables, the instructor rating had the highest relationship with overall course rating.

Another finding of this study is that of those variables correlated with the instructor rating, the highest was found to be methodology. This implies that good teaching methodology is recognized by students. Furthermore, presentation actually did not have a significant relationship. This implies that not only is there difference in presentation manner and teaching methodology, but that methodology has the influential impact. It appears that a well planned lesson is a very important factor in creating an effective classroom learning environment.

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Relationships of Student Perceptions of Classroom Learning Environment Factors
A Critique

Lonell Moeller, South Dakota State University -- Discussant

This study investigated the effect of various classroom variables upon teaching effectiveness and classroom learning. The study was conducted using ten randomly selected University of Nevada-Reno College of Agriculture instructors.

The researchers clearly explained the design and testing of the survey instrument. The use of field testing allowed the modification of the instrument to insure its reliability. It may be appropriate to define the model that was used in more detail. In addition, the class level of the respondents was not reported. Were the classes all one level, i.e. freshman, or did they encompass all grade levels?

The data were analyzed using Pearson correlation coefficients. An assumption was apparently made that the interaction of the variables was not a factor to be considered. Would a multiple regression analysis have produced different results? The results reported in Table 3 clearly indicate that relationships existed between several of the variables.

The results reported in Table 2 almost all indicate little variation in the ratings made by the students. Does this indicate that the groups were homogeneous or that some problems may exist in the design of the instrument or the collection of the data? This table did show the greatest variability for such factors as: too cold, seats uncomfortable, instructor speaks too fast, and visual aids used. Might this indicate that some of the rooms or instructors involved may have created interactions that are not accounted for in the study?

My primary concerns with the paper are with the authors' conclusions. It was concluded that if the instructor can provide reasonable lighting, comfort, and climate the students will adapt. Are these factors controlled by the institution and the designation of where a class will be held rather that by the instructor? In addition, the adaptability of the students and its impact upon learning was not addressed in this study.

It was determined that the instructor was the "key to the learning environment" and yet significant relationships were also reported for methods, content, and usefulness. The results of the study do not appear to justify so strong a statement.

A final suggestion would be to carefully edit documents prior to submission. This paper has several words that are misspelled and some that have been misused.

STUDENT MISBEHAVIOR AND JOB SATISFACTION OF VOCATIONAL AGRICULTURE TEACHERS: A CAUSAL ANALYSIS

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INTRODUCTION

As Craig (1985) pointed out, there has been a chronic national shortage of teachers of vocational agriculture for at least twenty years. A number of studies have been conducted to determine reasons why agriculture teachers leave the profession.

Allen (1976) found that the average teacher of agriculture in Oregon leaves teaching after less than five years of service. Thus, it seems apparent that one reason for the continuing teacher shortage is the high turnover rate among teachers. Grady and Burnett (1985) reported that teacher dissatisfaction with one or more aspects of teaching also contributes to this high turnover rate. Moore and Camp (1979) found that one important category of reasons concerned problems of various kinds in dealing with students. Knight (1978) reported that problems with students ranked second in importance among five broad categories of reasons that former Ohio teachers of vocational agriculture gave for leaving teaching. All of these studies implied that general morale of the former teachers had influenced their departures from the profession and that part of that morale problem stemmed from problems in dealing effectively with students and student behavior.

In a classic study, Brayfield and Roth (1951) discussed the impact and estimation of worker morale, and reported the development of their _Index of Job Satisfaction_. The instrument they reported has been used widely over the succeeding years. Snodgrass (1982) used the Brayfield-Roth _Index_ to study the job satisfaction of head state supervisors of agricultural education.

Bowen (1981) used the _Index_ to study the job satisfaction of faculty members in university agricultural teacher education programs. He found no significant relationship between job satisfaction of the teacher educators and type of institution, age, teaching experience, years in present position, or years in teacher education.

Kotrlik, Woodley, and Sharp (1982) found that vocational teachers were generally more satisfied with their jobs than non-vocational teachers in the public schools of Louisiana. Of more direct interest in the current study, Grady (1985) surveyed Louisiana secondary teachers of agriculture to determine the relationships among job satisfaction, years of teaching experience, school setting (rural/non-rural), size of school, degree held by teacher, and years of teaching experience. He found a positive relationship between years of teaching and job satisfaction and a negative relationship between size of school and job satisfaction.

Claycomb and Petty (1983) asked teachers for their perceived needs for assistance in coping with beginning teaching. One of the areas mentioned was student discipline. In a national study, Garrison and Camp (1984), on the other hand, indicated that student discipline was not a major problem for teachers of vocational agriculture. They did find regional differences as well as some situational differences (size of school, setting of school, sex of teacher, grade level taught, and years of teaching experience) among teachers in terms of their perceived levels of discipline problems.

PURPOSE

The purpose of this study was to determine whether there is a causal relationship between student behavioral problems and job satisfaction among teachers of vocational agriculture. More specifically, two research questions were addressed:

1. What effect does student misbehavior have on job satisfaction among teachers of vocational agriculture?

2. What external (exogenous) variables affect both student discipline problems and job satisfaction for the same group?

PROCEDURES

Statistical Procedure

Wright (1934) as reported in Pedhauser (1982) developed a statistical and theoretical method for establishing and estimating the strength of causality based on an examination of correlations among theoretically related variables, by means of the solution of simuntaneous structural equations. Duncan (1969), as reported in Pedhauser (1982), applied the science of structural equations to the examination of causality in the social sciences. One variation of the procedures involved has become widely known as path analysis. This study used path analysis techniques based on multiple regression procedures (Kenny, 1979).

The Model

To correct for the effect of external causes (exogenous variables) in path analysis, it is necessary to specify both the causes and the order in which they occur. For the purposes of this study, a three block causal model was examined.

The first block consisted of exogenous variables that the literature suggests impact on student discipline and job satisfaction among teachers of vocational agriculture: years of teaching experience, sex of teacher, type of community, size of school, and highest degree held by the teacher. Sex of teacher was dummy coded, m=1, f=0. Years of teaching experience was collected as an interval variable. size of school was collected in size categories (<1000, 1000-1999, >1999), but was taken to have an underlying continuous distribution, and was treated as interval. Type of community was collected and coded on a scale of large city=1 to rural=4 and taken to be interval.

The second block consisted of the overall perceived level of student misbehavior, as measured by the Student Misbehavior Survey

(SMS) developed by Camp and Bourne (1979). The SMS will be discussed in more detail under the Instrumentation section. Previous analysis of the data indicated that a strong second order curvilinear relationship exists between the student misbehavior variable and job satisfaction. Therefore the second block also contained the square of the SMS rating. The exogenous variables (block 1) were used in explaining the endogenous variables (block 2) as well as the criterion variable in block 3, job satisfaction, as measured by the Brayfield-Roth Index.

The substantive question was the effect of student misbehavior (as measured by the SMS) on job satisfaction (as measured by the Brayfield-Roth Index). Each of the variables was directly estimated with one indicator, producing a model with no latent variables to be estimated. The model was taken to be recursive, with either a correlation allowed or a causal path along all possible paths, see figures 1 and 2. Because the SMS score and its square are obviously correlated but hardly causal, a correlation was included in the model between those two endogenous variables. Thus the model is just-identified, making multiple regression the preferred method of path estimation. (Kenny, 1979)

Instrumentation

The instrument used in the study consisted of three parts. Part I collected the teacher and school background (exogenous) variables that would be used, including years of experience in teaching, sex, size of school, setting of school (rural, suburban, small city, large city), and highest degree held by the teacher.

Part II consisted of the Student Misbehavior Survey (SMS), Camp and Bourn (1979). The instrument consists of a list of 101 student misbehaviors ranging from not paying attention to homicide (actual or attempted). Garrison (1982) reported a Cronbach's alpha coefficient of reliability of .975 for the SMS. Its validity was established through a series of content, construct, and face validity examinations.

Part III, the Brayfield Roth Index of Job Satisfaction was used to collect a measure of the job satisfaction of the teachers sampled. The Index has a reported odd-even product-moment reliability coefficient, corrected by the Spearman-Brown formula, of .87 (Brayfield & Roth, 1951). Its validity as a measure of job satisfaction was established by both content validation procedures and comparison to other measures of job satisfaction. In addition, the survival in the literature and continued use of the instrument for over thirty-five years attest to its usefulness and validity.

Population and Sample

The population for the study was defined as all teachers of vocational agriculture teaching in the United States in the 1981-82 school year. It was further identified as the list of teachers in the Agriculture Teachers Directory (Smith, 1981), N=12,726. A systematic sample with a random start was used to select a sample of 605. The Krejcie and Morgan (1970) formula indicated a sample size of 373, based on a 5% error rate and a 95% confidence level.

The larger sample size was necessary to provide an adequate n for a factor analysis of Part II of the data.

Data Collection

A copy of the three-part questionnaire, along with a cover letter and a return envelope were mailed to each participant. Three weeks later a postcard reminder was sent, followed in another week by a second copy of the survey, a different cover letter, and another return envelope. A total of 437 usable responses were collected, for an effective response rate of 72%. A subsequent telephone follow-up showed no systematic differences between respondents and non-respondents. The data were analysed using the multiple regression procedures of the SAS statistical package. An alpha level for significance was set at $p<.05$.

RESULTS

Figure 1 shows the standardized effects among variables. An examination of the direct effects from the exogenous variables in block 1 to the endogenous variables in block 2, reveals that only years of experience had a significant path coefficient to either the level of perceived student misbehavior or its square, indicating both a linear and a curvilinear causal relationship from experience to misbehavior. Once the effects of the other variables are partialed out, the effects on student misbehavior of teacher sex, size of school, setting of school, and degree held by teacher, all fell close enough to zero to be statistically nonsignificant.

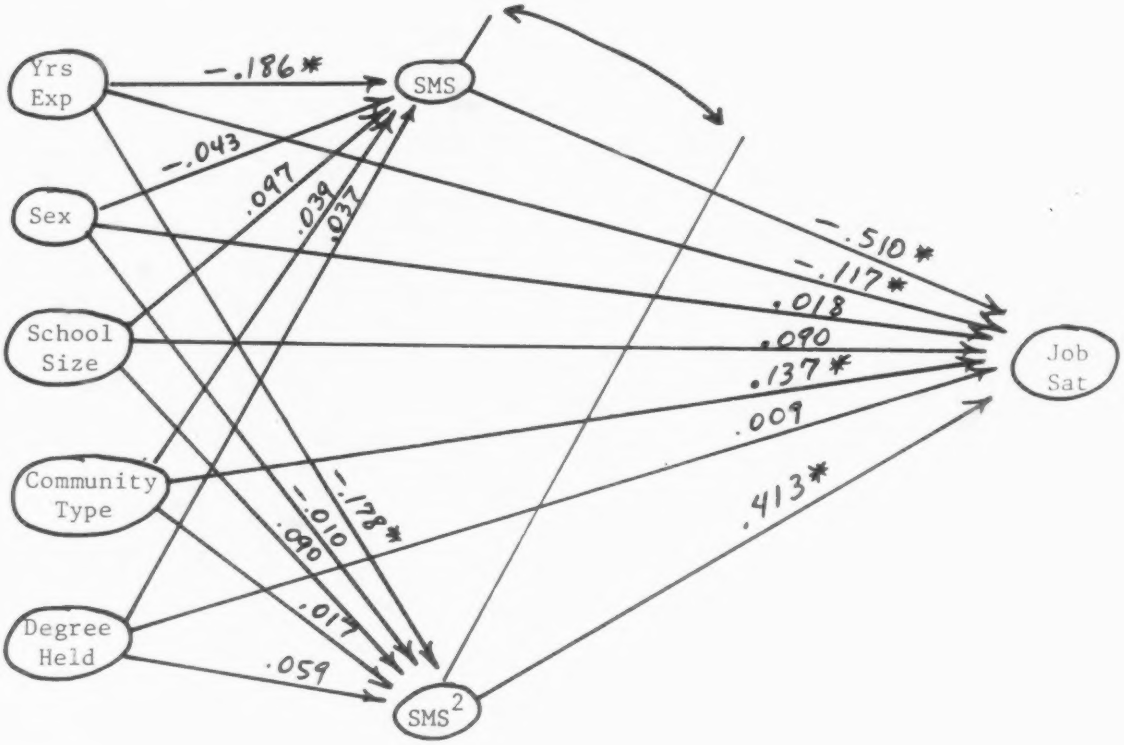
Looking further at the standardized coefficients leading to job satisfaction, figure 1, student misbehavior (linear) and its square (curvilinear) both had substantial direct effects, -.510 and +.413, respectively. The interpretation of this result is that as the teacher's perceived level of student misbehavior increases, the teacher's job satisfaction decreases, but does so at a decreasing rate, i.e. with an upward curve. One could conclude that discipline problems contribute to lowered job satisfaction, but that the effect tends to become marginally less pronounced as misbehavior problems continue to increase.

Finally, the coefficients from years of experience and community type to job satisfaction are both significant, -.117 and +.137, respectively. The interpretation of the first statistic is that, ceteris paribus, increased teaching experience produces a decline in job satisfaction for teachers of vocational agriculture, a rather disturbing finding. The second statistic is interpreted to mean that teaching in a rural community produces higher job satisfaction than teaching in a city, for vocational agriculture teachers. Given the nature of the subject matter taught, that is not surprising.

For substantive interpretations, figure 2 presents the metric (nonstandardized) path coefficients. One can say that for each additional year of teaching experience, the perceived level of student misbehavior in the teacher's classes decreases by 0.828 units of measure on the SMS.

Figure 1

Standardized Path Analytic Estimation of Causal Relationships Among Selected Exogenous Variables, Perceived Level of Student Misbehavior, and Job Satisfaction


Yrs Exp
Sex
School Size
Community Type
Degree Held
SMS
SMS²
Job Sat
−.186*
−.043
.097
.039
.037
−.510*
−.117*
.018
.090
.137*
.009
.413*
−.178*
−.010
.090
.017
.059

---

* $p < .05$

$R^2 = .055$

$R = .235$

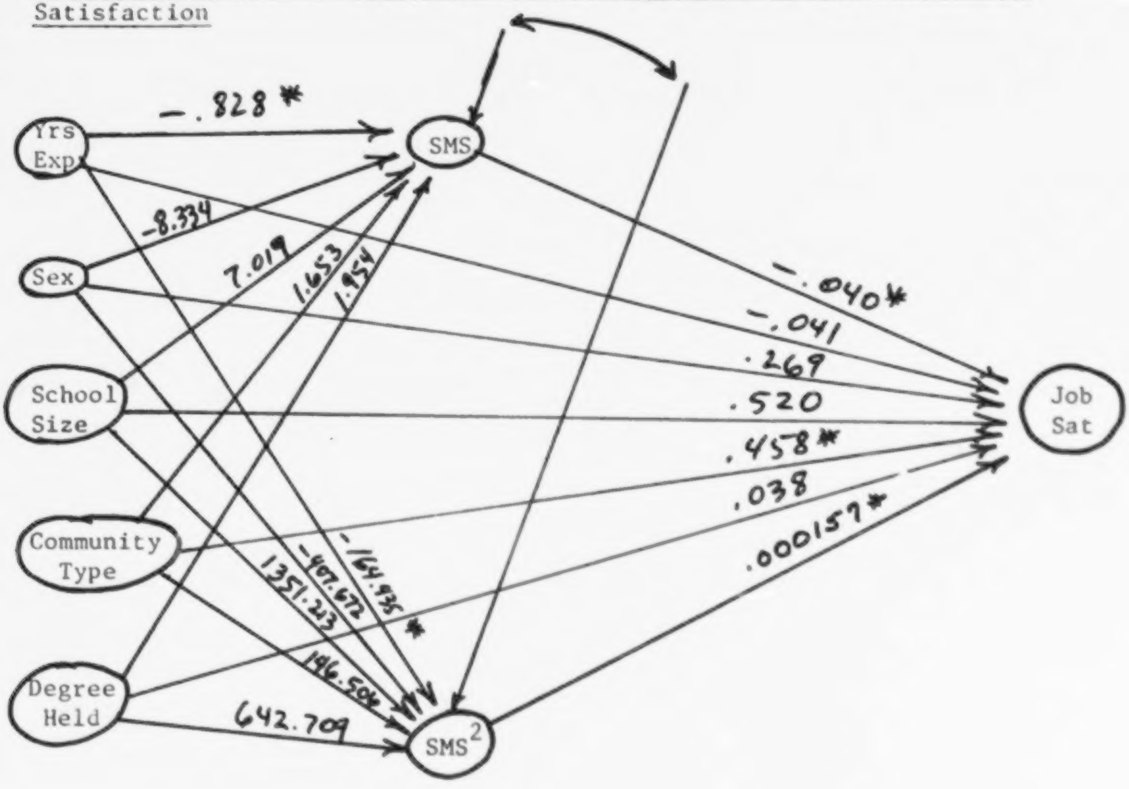
However, the path coefficient from years of experience to job satisfaction is somewhat surprising. Grady (1985) found the opposite relationship and Bowen (1981) found no relationship. Yet, when the effects of the other variables are controlled, an increase of one year of teaching experiences produces a significant direct decrease of .041 units of job satisfaction on the Index. Additionally, a significant indirect effect was produced from years of experience through both student misbehavior terms to job satisfaction (+.033 through SMS and -.026 through SMS-squared). Thus, the total effects of years of experience on job satisfaction equals -.034, metric units.

CONCLUSIONS AND RECOMMENDATIONS

Logic would indicate, and the literature would support the idea that a teacher's job satisfaction would suffer from increased student discipline problems. Indeed, this study found that to be

Figure 2

Metric Path Analytic Estimation of Causal Relationships Among Selected Exogenous Variables, Perceived Level of Student Misbehavior, and Job Satisfaction


Yrs Exp
Sex
School Size
Community Type
Degree Held
SMS
SMS²
Job Sat
-.828*
-8.334
7.019
1.653
1.954
-.040*
-.041
.269
.520
.458*
.038
.000157*
-407.672
-164.935*
1351.213
146.504
642.709

$* \ p < .05$

$R^2 = .055$

$R = .235$

true. In addition, the existence of such a strong curvilinear relationship from student misbehavior to job satisfaction is interesting in itself. However, the percent of variance explained in job satisfaction by this model is less than spectacular. On the other hand, we can conclude that student discipline problems do in fact have an overall negative impact on job satisfaction among agriculture teachers in the United States.

One surprising finding was that as years of teacher experience increased, so did level of reported student misbehavior. This leads to a recommendation that, as Claycomb and Petty (1985) found, new teachers need inservice help in handling discipline problems. More importantly, this study indicates that experienced teachers too, need such help in coping with their student discipline problems.

Even more interesting was the finding that increased years of teaching experience produced an actual decline in job satisfaction, when the other variables' effects were partialed out. That leads to the recommendation further research is needed to answer questions in several areas. Why does additional experience in teaching lead to a decline in job satisfaction among agriculture teachers? What can be done to counter this problem?

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Student Misbehavior and Job Satisfaction of Vocational Agriculture Teachers: A Causal Analysis
A Critique

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This study of Vocational Agriculture teachers and student behavior attempted to determine if there was a causal relationship between student behavior and job satisfaction.

The researcher is to be commended for selecting a relatively large sample size. This is not always the case in research projects. The reliability and validity of the survey instrument were well documented. The response rate of 72% was exceptional for a nationwide survey study. The follow up of non-respondents revealed no systematic differences between them and the respondents.

How were the three size categories selected? Did each category contain an equal part of the sample or were these values arbitrarily selected? The two variables school size and community type would seem to be closely related. Years of experience and degree held may also be related. Analysis of the data may have indicated that these areas could have been combined into two variables.

The relationship between perceived student misbehavior and job satisfaction were reported to become marginally less pronounced as perception of the misbehavior increased. Is it truly less pronounced or is it just increasing at a lesser rate?

The significant relationships between years of experience and community type to job satisfaction may well be a product of the large sample size. This may indicate an apparent tendency but certainly only a slight one. The fact that little of the variance can be explained indicates that many factors have not been identified in this study which contribute to job satisfaction.

The recommendation that new teachers be given inservice help in handling discipline problems does not seem to be supported by this study. The reported findings did not indicate an unsatisfactory level of perceived discipline problems for these teachers. On the contrary, the findings show that more experienced teachers seem to need the help with student discipline problems.

Certainly additional study of this problem needs to be conducted as recommended by the researcher. Two questions that may need to be addressed are:

1. Do teachers have increased perceptions of student misbehavior because experience allows misbehavior to be more easily identified?

2. What other factors relate to job dissatisfaction and are they more important than discipline problems?

TEACHING AGRICULTURAL MECHANICS USING SIMULATION

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INTRODUCTION

To respond to the rising public concern for quality educational programs, educators must be aware of alternative and innovative approaches of teaching and their potential for use in classrooms and laboratories. When current technological advancements are coupled with increased public interest and concern, the teaching profession offers many promises and challenges for the future. To improve educational programs, teachers must base more of their decisions related to the selection of teaching techniques and aids on empirical evidence. This study adds to the empirical information teachers need to rationally select alternative teaching techniques.

This study compared the effects of simulation and a conventional technique of instruction upon student cognitive achievement. The simulation technique incorporated the use of schematic symbols of dc electricity and hydraulic components which were used to form circuits using color-coded wire connectors. The conventional group used a power train or a tractor as the realia for instruction.

In teaching, Lee (1979) suggested that a variety of techniques and methods be used to deliver subject matter. He also identified the technique selection criteria as: (a) the nature of the subject or competency being taught,(b) what is available and practical, (c) safety of the students and teachers, (d) cost, and (e) depth of instructional coverage. A taxonomy of teaching techniques based upon the principle of decreasing reality consists of real life situations, followed by simulation of reality, and last by abstractions from reality (Spitze, 1980). Sometimes, according to the criteria stated by Lee (1979), real life situations may not be practical.

An alternative exists for teachers who find that teaching a unit at Spitze's highest taxonomy level is not practical, based on Lee's criteria for selecting techniques. This alternative is simulation. According to McClelland (1970), both the military and industrial sectors have recognized simulation as an effective teaching technique and have made extensive use of it in their training programs with satisfactory results.

Simulation devices range from simple homemade games and activities to large working models which cost several thousand dollars. A variety of these simulation devices can be found in vocational programs. Before money and time are invested, the effectiveness of simulation as a technique should be scientifically determined. McClelland (1970) recommended that vocational teachers not postpone the use of simulation because of a lack of empirical data. The purpose of this study, however, is to examine the effectiveness of simulation as a technique of instruction and to add to the empirical data base necessary for decision making.

PURPOSE AND OBJECTIVES

The primary purpose of this study was to compare the effectiveness of two teaching techniques on: (a) student low-level and high-level cognitive achievement, and (b) retention of information. Specifically, this study attempted to answer the following questions.

1. To what extent will immediate cognitive achievement be affected by the instructional technique as measured by an immediate posttest?

2. To what extent will delayed cognitive achievement be affected by instructional technique as measured by a delayed posttest?

Six null hypotheses were stated for the purpose of answering these research questions. Hypotheses one through three were concerned with immediate cognitive achievement with Mechanical Aptitude (MA) test scores used as the covariate. Hypotheses four through six were concerned with delayed cognitive achievement using MA as the covariate. For each hypothesis there were two subhypothesis which dealt with each subject matter. Each hypothesis and subhypothesis was test at the .05 alpha level.

Hypothesis one: There is no significant difference between the immediate cognitive achievement test scores (CP 1) of the two treatment groups when both techniques are administered by the same teachers with mechanical aptitude test scores used as the covariate.

Hypothesis two: There is no significant difference between the immediate low-level cognitive achievement test scores of the two treatment groups when both techniques are administered by the same teachers with mechanical aptitude test scores used as the covariate.

Hypothesis three: There is no significant difference between the immediate high-level cognitive achievement test scores (CP 1) of the two treatment groups when both techniques are administered by the same teachers with mechanical aptitude test scores used as the covariate.

Hypothesis four: There is no significant difference between the delayed cognitive achievement test scores (CP 2) of the two treatment groups when both techniques are administered by the same teachers with mechanical aptitude test scores used as the covariate.

Hypothesis five: There is no significant difference between the delayed low-level cognitive achievement test scores (CP 2) of the two treatment groups when both techniques are administered by the same teachers with mechanical aptitude test scores used as the covariate.

Hypothesis six: There is no significant difference between the delayed high-level cognitive achievement test scores (CP 2) of the two treatment groups when both techniques are administered by the same teachers with mechanical aptitude test scores used as the covariate.

PROCEDURES

This study was conducted as a randomized control-group posttest only experimental design (Isaac and Michael, 1983). The dependent variables were the immediate and delayed cognitive achievement scores of the students. The independent variables were instructional technique and time of testing. One technique involved the use of simulated dc electrical or hydraulic system components while the other technique involved the use of the actual dc electrical or hydraulic tractor components during instruction.

Figure 3. Research design and sequence of activities for each subject matter area and each group.

dc ELECTRICITY :	R	X	P1				P2	
	R		P1				P2	
HYDRAULICS :				R	X	P1		P2
				R		P1		P2

The population from which the sample was drawn consisted of the students who were enrolled in Mississippi public secondary vocational agriculture programs classified, by the State Department of Education, as "specialized agricultural mechanics programs." A total of 246 students from 12 schools were selected to participate in the study. Only data from 230 students and 11 schools were available for analysis.

The cognitive achievement tests were field tested with 34 ninth and tenth grade vocational agriculture students at West Marion County High School in Foxworth, Mississippi, in May of 1984, and by a class of nine Ford tractor mechanics in June of 1984. The pilot test yielded an alpha coefficient of .63 for the hydraulics test and .69 for the electrical test. The test format and wording were modified before use in the treatment.

The information required to aid in the control of initial differences of subjects was supplied by the Science Research Associate's (SRA) Test of Mechanical Concepts (MA) (Stanard and Bode, 1976). Administration of the MA took place after the treatment and testing. The MA test was administered by the teacher, consisted of 78 multiple-choice questions which were divided into five parts, and required 45-55 minutes for completion.

Immediate cognitive achievement for each subject matter was measured by cognitive posttest one (CP 1), and delayed cognitive achievement was measured by cognitive posttest two (CP 2). CP 1 and CP 2 were identical for each subject matter area: dc electricity and hydraulics. CP 1 was to be administered 1 to 3 days following the treatment. Teachers administered CP 2 three weeks after administering CP 1. Each test contained 50 multiple-choice items. Each set of tests was machine scored by the researcher. The reliability coefficients for each CP 1 and CP 2 for each subject matter test averaged .82 to .89. Out of a possible 50 points the scores for CP 1 ranged from 5 to 47 for dc electricity and from 2 to 49 for hydraulics for individual subjects (Table 1). Low-level and high-level cognitive questions were identified by three experts in the area of student testing. To be considered as a low-level question, the question had to be judged as Knowledge, Comprehension or Application in Bloom's taxonomy (Bloom, 1957). The remaining high-level questions were judged to be in the Analysis, Synthesis, and Evaluation levels. Test scores for each subject and group can be reviewed in Table 1.

Table 1

Mean Cognitive Achievement Scores for Subject and Technique for Ho 1, Ho 2, Ho 3, Ho 4, Ho 5 and Ho 6

		Subject Matter			
		dc Electricity		Hydraulics	
Hypothesis	Technique	M	MA	M	MA
Ho 1	CONVENTIONAL	25.92	23.83	29.07	30.40
	SIMULATION	32.34	34.91	25.75	24.43
Ho 2	CONVENTIONAL	23.15	21.07	21.74	22.61
	SIMULATION	29.36	31.90	19.56	18.61
Ho 3	CONVENTIONAL	2.69	2.69	7.49	7.97
	SIMULATION	2.87	2.87	6.31	5.79
Ho 4	CONVENTIONAL	22.07	19.77	28.98	31.42
	SIMULATION	28.01	30.31	22.53	18.82
Ho 5	CONVENTIONAL	19.46	17.27	21.39	23.05
	SIMULATION	24.90	22.09	17.04	11.51
Ho 6	CONVENTIONAL	2.70	2.74	7.77	8.65
	SIMULATION	2.79	2.83	5.43	4.10

Note. M = Unadjusted Mean; MA = Adjusted Mean

All schools began the treatment on a Monday and ended on a Friday. Each treatment took 5 school days (10 clock hours) to complete. Data collection (not including the administration of the MA) and treatment spanned a 7-week time period.

Six schools were randomly assigned to the simulation treatment. The remaining six schools used the technique involving a power train unit or tractor. All schools taught dc electricity first. Both groups completed their treatments and, after 1 week of nonrelated instruction to prevent contamination, used the alternate technique with hydraulics.

Students in the conventional group received instruction and explanation via the power train or tractor. They did not have hands-on experience but were shown the location sequence and function of the components on the power train or tractor. Students in the simulation group did not use a power train or tractor. Instead, to meet the instructional objectives the students used a simulation activity. The simulation involves the use of a card deck of schematic symbols connected together by wire connectors to form a specific hydraulic or dc electrical system as defined by a activity sheet.

Five pieces of data were collected from each student for use in testing the hypotheses: (a) MA test score, (b) score on CP 1 for dc electricity, (c) score on CP 2 for dc electricity, (d) score on CP 1 for hydraulics, and (e) score on CP 2 for hydraulics. CP 1 was administered 1 to 3 school days following the treatment. CP 2 was administered 3 weeks after CP 1. The MA test was administered after CP 2.

ANALYSIS OF DATA

A nested or hierarchal statistical design with school nested within method was used to analyze the data. Kennedy (1978) stated that by nesting a variable, the variable could be estimated and controlled. School was the nestor variable because students were selected as intact groups by school. Analysis of covariance, with MA test scores used as the covariate, was used to test each hypothesis for significance at the .05 alpha level.

RESULTS

The results of data analyses for each hypothesis are summarized in Table 2. In testing hypotheses one through three no significant difference was found in the immediate scores for the two techniques of instruction when MA test scores were used as the covariate (Table 3). The same was true for hypotheses four through six in testing for a significant difference in delayed cognitive achievement while using MA test scores as the covariate. This was true for both subject matters (Table 3).

CONCLUSION AND/OR RECOMMENDATIONS

Based on the finding of this study, it can be concluded that there were no statistically significant differences in immediate (CP 1) or delayed (CP 2) cognitive posttest achievement scores for dc electricity or hydraulics subject matter as a result of using different techniques. Therefore, simulation is as effective an instructional technique as the conventional realia. These findings are in harmony with Cherryholmes (1966), Cohen and Brandley (1978), Hienkel (1970), McClelland (1970), Perritt (1981), and Pierfy (1977). However, these findings are not consistent with the findings of Abrams (1974) and Adams (1976). From the findings of this study, simulation can be effectively used to deliver cognitive information related to basic dc electricity or hydraulics with no significant difference in student cognitive achievement as the result.

Table 2

Summary of Analyses of Each Hypothesis

	Subject Matter	
Hypothesis	dc Electricity	Hydraulics
1. CP 1 Overall with MA	FR	FR
2. CP 1 Low-level with MA	FR	FR
3. CP 1 High-level with MA	FR	FR
4. CP 2 Overall with MA	FR	FR
5. CP 2 Low-level with MA	FR	FR
6. CP 2 High-level with MA	FR	FR

Note. FR = Fail to Reject. "With" indicates the covariates MA.

The lack of significant difference in the cognitive test scores of students should be viewed as a positive indication of the effectiveness of simulation as an instructional technique. Simulation may be used when realia is not available to teach the basic principles of dc electricity or hydraulics. The cost of producing the simulation activity in this study was approximately $25.00 per class of 20 students. The alternative would be to incorporate a tractor or power train unit into the instructional unit. The cost and availability of such equipment could be a deterent to instruction in some programs.

The statistical analysis did not indicate a significant difference in the two techniques of instruction. However, the scores for the simulation group for the subject of dc electricity were consistently higher than the scores for the conventional groups while the conventional test scores for hydraulics were consistently higher than the scores for the simulation technique. In other words, simulation resulted in higher scores for the subject of dc electricity and lower scores for hydraulics. Several explanations may be considered for this occurence. First, we recognize the directions of the scores may be due to chance, however simulation is more abstract that reality. This may cause students with less abstract reasoning ability to have greater difficulty and eventually score lower on the posttest. To compound the problem of the different abstract reasoning levels of students, the subject of dc electricity is more abstract than hydraulics. The movement of fluids can be observed and concretely understood through simple observation in the world. However, the movement or flow of electrons is not as easy to comprehend. Another important point to consider in analyzing the results of the study would be the simulation kit. Each kit for both hydraulics and dc electricity consisted of electrical wire (16-20 AWG) and electrical clips. These materials are associated with the area of electricity, allowing more similarity between the kit and electricity than between the kit and the area of hydraulics.

Table 3

A MANCOVA of Scores by Technique for Ho 1, Ho 2, Ho 3, Ho 4, Ho 5 and Ho 6

Ho	SUBJECT	M2	F VALUE	SIGN. OF F	CRITICAL F
1	E	528.74	0.68	.44	5.59
	H	324.10	0.19	.67	5.32
2	E	491.84	0.78	.41	5.59
	H	139.55	0.14	.72	5.32
3	E	0.39	0.04	.85	5.59
	H	42.26	0.50	.50	5.32
4	E	493.73	0.43	.54	5.99
	H	1940.16	2.30	.18	5.99
5	E	518.73	0.51	.50	5.59
	H	928.53	1.84	.22	5.99
6	E	1.17	0.23	.65	5.99
	H	928.53	1.84	.22	5.99

Note. E = dc Electricity H = Hydraulics.

The purpose of the study was not to compare dc electricity to hydraulics but to compare the effectiveness of simulation to the conventional technique of instruction in relation to student performance on a cognitive posttest. Based upon the findings of this study, simulation can be recommended as a part of instruction in the absence of real equipment for basic instruction in dc electricity and hydraulics. For learning the basic cognitive concepts, principles and the basic principles of troubleshooting for the subjects of dc electricity and hydraulics, simulation activities can provide students with basic knowledge and understanding. The development of motor skills and proficiency in service and repair may require instruction and supervised practice on the real equipment. Simulation can provide students with an opportunity to develop the basic cognitive skill in a inexpensive way which can systematically lead students from the simple to the complex while allowing for flexibility in the development of understanding.

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TEACHING AGRICULTURAL MECHANICS USING SIMULATION
A Critique

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Introduction

This study was conducted as a randomized control-group posttest only experimental design (Isaac & Michael, 1983). This is a unique study because of the design which attempts to compare the effects of simulation and a conventional technique upon student cognitive achievement. This entire effort is important because it attempts to clarify the conventional wisdom or what we think we already know.

Significant Findings

The researchers found no significant differences in immediate or delayed posttest cognitive achievement scores for dc electricity or hydraulics subject matter as a result of using different techniques. They reasoned, therefore, that simulation is at least as effective as the conventional realia as a teaching technique.

Strengths

Doing experimental research in education is not often easy or even possible. When researchers are able to organize and develop an experiment of the depth and nature of this effort, good and significant work has been done. Using instructional techniques for an experimental study is not the same thing as planting peas in a flat and then measuring the differences that occur. By utilizing an experiment, the researchers have gained new knowledge, and the profession is better because of it.

Recommendations

Several technical concerns develop as one studies this particular paper. There was unexplained mortality with 246 students and 12 schools selected, but data were available for 230 students and 11 schools. This should be explained. The pilot test yielded relatively low alpha coefficients for the hydraulics and electrical tests. Two sets of reliability scores were reported. How are these different?

No significant differences were found between the two techniques. It could be that there is no difference. However, it may be that there simply was not enough difference in the beginning.

THE COOPERATIVE RELATIONSHIP BETWEEN VOCATIONAL AGRICULTURE TEACHERS AND EXTENSION AGENTS

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INTRODUCTION

Agricultural education can be defined as the process of providing knowledge, skills, and competencies that are necessary for the production and/or processing of plants and animals or their products useful to people. This process is carried out in different forms and by a variety of people and organizations.

Two groups that have been established for the purpose of agricultural education are the Cooperative Extension Service and the public school vocational agriculture program. Both of these agencies are involved in providing knowledge, skills, and competencies that relate to agriculture. Each uses similar methods for providing knowledge and each serves a similar variety of people. Since the purpose and clientele of each agency are similar, it is therefore likely that cooperation would and should occur. However, cooperation does not happen just because the extension agent and vocational agriculture teacher are providing similar services to similar clientele. This fact is known and stated by Anderson (1979), an extension specialist:

> Even though we are closely related by education, experience and job responsibilities, vo-ag instructors and extension personnel like to stake out their own territories. We see them as mutually exclusive, competitive operations (p.55).

If this problem is to be overcome, and if cooperation is to occur between the two groups, the following questions need to be answered: (a) What factors hinder or enhance cooperation between vocational agriculture teachers and cooperative extension agents? (b) What activities are appropriate for cooperation? Only after these questions have been answered can the cooperative relationship flourish.

A review of the literature revealed a continuous need for dialogue between vocational agriculture teachers and county extension agents. The literature also revealed a need to analyze and understand the goals and objectives of the two agencies as well as the areas of overlapping responsibility and the areas where cooperation occurs. Though studies have been done in several states, the literature review revealed no study conducted in North Carolina which analyzed the cooperative relationship between teachers of vocational agriculture and county extension agents. Studies conducted in other states revealed disagreement as to the factors that hinder cooperation. For example, in a 1979 study conducted in New York by Wood, it was determined that age had no significant effect on the cooperative relationship between vocational agriculture teachers and extension agents. A similar study conducted in 1983 by Diatta concluded that age was a factor having a slightly negative effect on cooperation between teachers of vocational agriculture and county extension agents in North Dakota.

In order to better understand the factors that hinder or enhance cooperation and to determine the areas where cooperation is occurring, further study is needed.

PURPOSE AND OBJECTIVES OF THE STUDY

The primary purpose of this study was to determine the amount and types of cooperation that occur between vocational agriculture teachers and county extension agents in North Carolina. A secondary purpose was to aid vocational agriculture teachers, county extension agents, teacher educators, and administrators in their understanding of the cooperation that is possible and desirable between agency personnel. The following objectives served as guidelines in the acquisition and analysis of the data:

1. To determine the factors that enhance or hinder cooperation between vocational agriculture teachers and county extension agents.

2. To determine the existing level of cooperation between teachers of vocational agriculture and county extension agents in various activities, such as youth programs, adult programs, training programs, and special projects.

PROCEDURE

The population for this study was composed of two groups, 390 vocational agriculture teachers and 100 County Extension Chairmen in North Carolina. The research sample consisted of 194 or 49.74% of the population of vocational agriculture teachers and 80 or 80.00% of the population of County Extension Chairmen. The sample sizes were determined using the formula for calculating the sample size needed when the size of the population is known as discussed in Educational and Psychological Measurement by Krejcie and Morgan (1970). The formula was calculated using a 95% confidence level for the table value of chi-square and .05 as the degree of accuracy expressed as a proportion.

The instrument used in the study was developed by the researchers after consulting survey instruments of similar studies, Diatta, 1983; Buddle, 1981; Wood, 1979. Content validity and reliability were established through field testing of the instrument. The reliability of the final instrument as measured by the Cronbach Alpha Reliability Coefficient was .8454.

The two samples were sent the same questionnaire. The first section of the instrument listed various factors which influence cooperation. The teachers and extension chairmen responded using a five-point scale as to whether the factors had a negative or positive effect on cooperation. In the second section of the instrument, the perceptions of the vocational agricultural teachers and county extension chairmen were obtained as to the appropriateness and occurrence of various cooperative activities. The respondents were asked to indicate yes or no for the appropriateness and occurrence of the activities.

The data were collected with an initial mailing and one follow-up. Eight (11%) of the non-respondents from the sample of vocational agriculture teachers were randomly selected and were administered the questionnaire over the phone. The data collected via the telephone were analyzed to determine whether there was a non-respondent bias in this sample. It was determined that no bias existed and the data from the telephone contacted respondents were then included in the sample population.

ANALYSIS OF DATA

Descriptive and inferential statistics were used to analyze the data from both sections of the questionnaire. The TTEST subprogram of the Statistical Analysis system (SAS) was used to calculate the mean score of each factor, to determine which factors were said to enhance or hinder cooperation, and to determine whether there was a significant difference in the responses between the vocational agriculture teachers and the county extension chairmen. Since the factors on the questionnaire could not be proven to be independent variables, the alpha level was set at .01 to reduce the effects of experiment-wise error. The second section of the questionnaire was analyzed using the CHISQ subroutine of the FREQ subprogram of SAS.

RESULTS

The survey instrument was sent to 194 vocational agriculture teachers and 80 county extension chairmen. The total response was 132 or 68% of the vocational agriculture teachers and 78 or 97.5% of the extension chairmen.

Factors Affecting Cooperation

Fifteen factors as shown in Table 1 were analyzed to determine the effect they had on the cooperative relationship between vocational agriculture teachers and county extension agents. None of the factors were determined to hinder or greatly hinder the cooperative relationship of the two professional groups. All fifteen factors were rated as either having no effect on cooperation or as enhancing the cooperative relationship. All of the factors except "recognition received from colleague" were rated higher by vocational agriculture teachers than by county extension chairmen. The factor "colleague's attitude toward you" had the highest mean score and was perceived by both groups as having the greatest positive effect on the cooperative relationship.

Though the means for the factors effecting cooperation were consistently higher for vocational agriculture teachers, the difference in the means was rarely significant. The mean for the factor "educational background of colleague" was 3.39 as perceived by extension chairmen and 3.73 as perceived by vocational agriculture teachers. The t-test analysis revealed a significant difference in perceptions at the .01 level.

"Instructional methods" and "colleague's years of experience" were factors perceived by vocational agriculture teachers towards enhancing ($\bar{x} > 3.50$) the cooperative relationship. County extension chairmen perceived these factors as having less effect ($\bar{x} < 3.50$) on cooperation between the two agencies.

Table 1

Means, Standard Deviations, and T-Test Values for Factors that Effect Cooperation Between Extension Chairmen and Vocational Agriculture Teachers

Factors Effecting Cooperation	Extension Chairmen (n=78) M/SD (a)	Vo-Ag Teachers (n=132) M/SD (a)	T-test Analysis t-value	p-value
Colleague's attitude toward you	3.90 0.96	4.08 0.86	1.15	.251
Colleague's personality	3.81 0.87	4.03 0.82	1.66	.099
Community needs	3.71 0.67	3.83 0.67	1.46	.145
4-H, FFA Contests	3.65 0.64	3.86 0.81	1.86	.064
Colleague's years of experience	3.44 0.75	3.77 0.71	3.20	.002 *
Program objectives	3.53 0.66	3.68 0.71	1.83	.069
Educational background of colleague	3.39 0.69	3.73 0.67	3.92	.000 *
Publicity of colleague's work	3.38 0.52	3.55 0.67	1.44	.152
Influence of advisory committees	3.42 0.59	3.43 0.61	0.24	.810
Population to be served	3.36 0.74	3.47 0.75	1.20	.230
Instructional methods	3.26 0.59	3.52 0.64	3.33	.001 *
Recognition received from colleague	3.44 0.69	3.36 0.81	0.32	.746
Influence of administration	3.16 0.67	3.31 0.69	1.50	.136
Age of colleague	3.10 0.41	3.20 0.49	1.64	.103
Distance between your office and your colleague's office	2.94 0.79	3.11 0.88	1.57	.118

* $p < .01$

a Note: 1 = Greatly Hinders 2 = Hinders 3 = No Effect 4 = Enhances
5 = Greatly Enhances

According to the t-test, the difference in perception of the two groups is significant at the .01 level.

Appropriateness and Occurrence of Cooperative Activities

Nineteen activities that could be appropriate for cooperation were listed in the second section of the instrument and are shown in Table 2. Seventy percent or more of both professional groups perceived all of the activities except one to be appropriate for cooperation. "Conduct fund raisers" was perceived by a majority of the sample to be an activity inappropriate for cooperation between vocational agriculture teachers and county extension agents. "Serve as an information source," "communicate via phone or letter," and "share publications" were the activities perceived by the largest percentage of county extension chairmen and vocational agriculture teachers to be appropriate for cooperation. Seventy-five percent or more of the chairmen rated all the activities except "serve on colleague's advisory committee," "participate in joint in-service training," "conduct fund raisers," and "organize demonstration plots" as appropriate for cooperation. Only 26.0% of the extension chairmen rated "conduct fund raisers" as an appropriate activity for cooperation.

For all of the activities but two, "serve as an information source" and "invited to awards banquet," the percentage of vocational agriculture teachers who perceived the activities as appropriate was greater than the percentage of extension agents who perceived the activities as appropriate. There were significant differences in the perceptions of vocational agriculture teachers and county extension chairmen as to the appropriateness of the activities "participate in joint in-service training," "share publications," "share teaching materials," "conduct fund raisers," "organize demonstration plots," and "conduct adult classes."

According to the findings in Table 2, all of the activities except one were perceived to be appropriate for cooperation by a majority of the sample. The number of cooperative activities perceived as occurring by a majority of the county extension chairmen and vocational agriculture teachers is much smaller. A majority of the county extension chairmen perceived cooperation occurring in only 10 of the 19 activities. "Share publications," "serve as an information source," and "communicate via phone or letter" were the activities rated by the largest percentage of extension agents to be occurring cooperatively. The same activities were perceived by over 80% of the vocational agriculture teachers as occurring.

"Conducting fund raisers" received the lowest rating as an activity occurring cooperatively. Similarly, "serving on a colleague's advisory committee" was perceived by approximatly one-fourth of the county extension chairmen and vocational agriculture teachers. The two groups differed significantly in their perceptions of the occurrence of the following cooperative activities: "participate in joint in-service training" and "share teaching materials." For both of these activities, the difference was significant at the .01 level.

Table 2

Ratings of Extension Chairmen and Vocational Agriculture Teachers for Appropriateness and Occurrence of Cooperative Activities and Differences in Perceptions as Measured by Chi-Square

	Extension Chairmen				Voc. Agric. Teachers					
	Appropriate		Occurrence		Appropriate		Occurrence			
	Yes	No	Yes	No	Yes	No	Yes	No		
Activity	n(a) %[a]		n %		n %		n %		Appr.[b] Chi-Square	Occur.[b] Chi-Square
Serve on colleague's advisory committee	54 70.1	23 29.9	20 27.0	54 73.0	101 79.5	26 20.5	31 24.8	94 75.2	2.53	2.00
Serve as an information source	77 98.7	1 1.3	68 88.3	9 11.7	125 96.9	4 3.1	108 85.7	18 14.3	.62	.72
Share community survey material	70 89.7	8 10.3	41 53.9	35 46.1	121 93.8	8 6.2	85 68.5	39 31.5	2.01	2.91
Participate in joint in-service training	54 69.2	24 30.8	17 22.1	60 77.9	109 84.5	20 15.5	68 53.5	59 46.5	7.65**	17.62**
Communicate via phone or letter	76 97.4	2 2.6	70 92.1	6 7.9	12.8 99.2	1 .8	125 98.4	2 1.6	1.18	2.44
Share newsletters	64 83.1	13 16.9	41 53.2	36 46.8	110 85.3	19 14.7	85 66.9	42 33.1	.29	3.57
Share publications	69 89.6	8 10.4	61 81.3	14 18.7	125 96.9	4 3.1	106 84.1	20 15.9	5.04*	.07
Share teaching materials	61 79.2	16 20.8	36 47.4	40 52.6	122 94.6	7 5.4	98 77.8	28 22.2	12.29**	18.96**
Invited to awards banquet	67 85.9	11 14.1	43 56.6	33 43.4	109 85.2	19 14.8	64 51.6	60 48.4	.19	1.00
Serve as a guest speaker	67 85.9	11 14.1	44 57.1	33 42.9	111 86.7	17 13.3	58 46.4	67 53.6	.02	3.19

Table 2 (continued)

	Extension Chairmen				Voc. Agric. Teachers					
	Appropriate		Occurrence		Appropriate		Occurrence			
	Yes	No	Yes	No	Yes	No	Yes	No	Appr.[b] Chi-Square	Occur.[b] Chi-Square
Activity	n %[a]		n %		n %		n %			
Joint participation at county fairs	63 85.1	11 14.9	38 54.3	32 45.7	114 89.8	13 12.4	86 68.8	39 31.2	1.75	4.34
Train judging teams	64 82.1	14 17.9	42 54.5	35 45.5	113 87.6	16 12.4	67 53.2	59 46.8	1.50	.05
Conduct community service project	62 79.5	16 20.5	29 38.2	47 61.8	109 84.5	20 15.5	57 45.2	69 54.8	1.03	1.07
Conduct fund raisers	20 26.0	57 74.0	6 7.7	72 92.3	55 43.0	73 57.0	18 14.3	108 85.7	6.45*	1.75
Joint participation in livestock shows	69 89.6	8 10.4	49 64.5	27 35.5	115 89.8	13 10.2	84 66.7	42 33.3	.02	.05
Organize demonstration plots	57 73.1	21 26.9	25 33.3	50 66.7	114 88.4	15 11.6	43 34.1	83 65.9	9.72*	.05
Conduct adult classes	60 77.9	17 22.1	28 35.9	50 64.1	112 87.5	16 12.5	60 47.6	66 52.4	3.78	2.86
Conduct short courses/ workshops	65 84.4	12 15.6	30 39.0	47 61.0	114 88.4	15 11.6	67 52.8	60 47.2	.87	3.75
Conduct field trips	68 87.2	10 12.8	36 46.8	41 53.2	120 93.0	9 7.0	77 60.6	50 39.4	2.28	3.65

[a] % calculated based on the number responding "yes" or "no"; missing values were not included in the reporting of the "n" or "%."

[b] Chi-square value for the difference in perceptions of the sample of County Extension Chairmen and the sample of vocational agriculture teachers.

*$p < .05$
**$p < .01$

CONCLUSIONS

1. The factors affecting cooperation vary in their impact. There is no one factor considered by a majority of the sample to hinder cooperation.

2. The personality and attitude of one's colleague are considered to enhance cooperation as is the similarity of program objectives.

3. County extension chairmen and vocational agriculture teachers agreed upon a majority of the activities investigated in this study as appropriate for cooperation.

4. Though both professional groups agree as to the activities that are appropriate for cooperation, the actual performance of these activities does not occur among a large portion of the agricultural educators.

RECOMMENDATIONS

The following recommendations are made on the basis of the conclusions of this study.

1. The purpose and objectives of the Agricultural Extension Service and vocational agriculture should be seen as complementary and compatible. Vocational agriculture teachers and county extension chairmen both said "program objectives" was a factor enhancing cooperation. It is therefore recommended that those people preparing to be vocational agriculture teachers or extension agents should be aware of ways they can serve or be served by each other.

2. Because of the disproportioned response between the perceived appropriateness and occurrence of cooperative activities, further investigation is needed to determine factors that prevent the occurrence of cooperative efforts.

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The Cooperative Relationship Between Vocational Agriculture Teachers and Extension Agents

Clifford L. Nelson, Washington State University - Discussant

The researchers have approached a topic that deserves professional attention in Agricultural Education and Cooperative Extension. The implications of closer cooperation have seldom been addressed in professional forums.

The study approaches the question of what factors enhance or hinder intergroup cooperation by asking field based personnel their perceptions. The study also focused on determining the current level of cooperation that exists between the two professional groups. Both vocational agriculture and extension are "prisoners of the law." Constraints applied by state supervisors and extension administrators often might be major barriers to cooperation. In one state known to this author the chairman of the department of agricultural education and the state 4-H leader had not spoken for 23 years. This type of historic confrontation might still exist. Thus many of those surveyed in this study may not be at an awareness of administrative level to accurately represent the real situation.

The researchers are to be commended for their sampling and instrument reliability development procedures. Excellent returns were achieved with extension and adequate returns from vocational agriculture participants.

The call for further research in the area of cooperation between vocational agriculture and extension is justifiable. As pressures of further reductions of Federal funds available for vocational agriculture and extension can be expected, the need for further cooperation is mandated. As the Federal dollar becomes a less important part of the budgets for vocational agriculture and extension, further cooperation is expected.

A study of the state and national-level administrators and leaders of vocational agriculture and Cooperative Extension is recommended. A study of the letters of agreement between vocational agriculture and extension might also be of benefit.

A better title for the study might have the words "As Perceived by Agents and Teachers" added.

THE IMPACT OF THE VOCATIONAL EDUCATION ACT OF 1963 ON AGRICULTURAL EDUCATION

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INTRODUCTION

> Vocational education's past appears to be largely unknown to many of today's educators. Consequently they are denied real knowledge of its foundations. Furthermore, when they move into proposed new ventures they are unaware whether this new venture is really new or just a warmed over reject of the past (Barlow, 1981:21).

Federal legislation and federal funding since the passage of the Smith-Hughes Act in 1917 have had far reaching implications for all vocational education of less than college level. While several schools of thought have existed concerning the impact of federal aid upon vocational education, there has been general agreement that federal funds have provided the necessary stimulus for change and direction of vocational programs (U.S. Department of Health, Education, and Welfare, 1963:4).

The passage of the Vocational Education Act of 1963 marked a dramatic change in the history of agricultural education. This act broadened and redirected programs in vocational agriculture and created a shift in the concept of agricultural education from providing training to present and future farmers to providing occupational training in the broad field of agricultural occupations. Camp and Crunkilton (1985:63) identified the passage of the act as one of the ten most important events in the history of agricultural education.

Since the Vocational Education Act of 1963 was enacted, few studies have been made to determine its effects on vocational education and on agricultural education in particular. While there is a great deal of information available concerning the Vocational Education Act of 1963, including federal documents and research studies conducted in several areas of vocational education, there is a scarcity of information which treats the act specifically in relation to agricultural education. This study attempted to identify the impact of the Vocational Education Act of 1963 on agricultural education.

PURPOSE AND OBJECTIVES

The purpose of this study was to examine and analyze the effect of Public Law 88-210, the Vocational Education Act of 1963, on agricultural education in the public schools of the United States. The problem in this study was that the impact of the Vocational Education Act of 1963 on agricultural education in the public schools was not known. The study attempted to identify the nature and scope of agricultural education programs offered prior to and subsequent to the passage of the Vocational Education Act of 1963 and to determine how the legislation affected programs offered. The specific objectives of the study were to:

1. Develop a chronology of federal legislation affecting agricultural education preceding the enactment of Public Law 88-210.
2. Develop a profile of agricultural education programs offered prior to and subsequent to the enactment of Public Law 88-210.
3. Identify deficiencies in legislation affecting agricultural education that was enacted prior to 1963.
4. Identify the need for the 1963 legislation.
5. Analyze the provisions of Public Law 88-210 which had an impact on agricultural education.
6. Analyze the effect of the 1963 legislation on the nature and success of programs in agricultural education.

Hypotheses were formulated to guide examination of the individual questions raised by the objectives in the study.

PROCEDURE

The methodology employed in this study involved using proper historical research techniques. These are briefly outlined here.

Given that a research problem has been identified and a few initial hypotheses have been formulated, the first step is the collection of source materials. Source materials may be catagorized as either primary or secondary. The second step consists of subjecting the source materials to a critical evaluation as to their trustworthiness and value to the research problem. The third step is a synthesis of the information from the source materials. It is at this point that the hypotheses may be revised or new ones formulated. Finally, the researcher rejects or accepts hypotheses, makes final interpretations, and draws conclusions (Wiersma, 1975:351).

Since historical research involves a description of past events, there is no possibility of control or manipulation of variables in the experimental sense. The aspect of critical inquiry is important. "As control and manipulation of variables are essential to the experimental approach, so is critical inquiry essential to historical research" (Wiersma, 1975:155).

This study was intended to be an examination of the impact of the Vocational Education Act of 1963 on agricultural education. For this reason, evaluation of the impact was restricted to the years 1963-1970, after which subsequent federal legislation came into effect. While legislation for vocational education is not restricted by vocational subject, and does in fact address broad categories such as agricultural, home economics, and trades and industry education in one piece of legislation, the study focused only on the parts of the legislation that affected agricultural education.

ANALYSIS OF DATA

The methodology employed in this study was consistent with the steps outlined above. References were initially located by conducting a computerized search of the Dissertation Abstracts Online and the Educational Resources Information Center (ERIC) databases. Source materials utilized in the study included numerous government documents and reports, unpublished dissertations, journal articles from The Agricultural Education Magazine, the American Vocational Journal, other selected journals, and numerous books on the history and development of legislation and vocational education. Sources were located utilizing the services of the McKeldin Graduate Library at the University of Maryland, College Park, Maryland, The Library of Congress, the National Future Farmers of America Center, the American Vocational Association, and the U.S. Office of Education.

RESULTS

The enactment of the Vocational Education Act of 1963 can be considered as one of many steps in the evolution of vocational education in the United States. Federal funding for vocational education of less than college level was begun with the passage of the Smith-Hughes Act in 1917. This act contained the basic provisions that shaped the direction of vocational education in agriculture prior to the passage of the Vocational Education Act of 1963. It specified that the purpose of agricultural education should be to fit students for useful employment; that programs should be of less than college grade and be designed to meet the needs of persons over fourteen years of age who had entered upon or who were preparing to enter upon the work of the farm or of the farm home. Students in agricultural education were required to engage in a supervised practice program for a minimum of six months each year on a farm provided either by the school or on another farm under the provisions of this act.

The Smith-Hughes Act established guidelines which would shape the programs offered in agricultural education for the next half-century with almost no modifications. The act emphasized skill training to meet the existing needs of the labor market. It was a very specific act designating the subjects to be taught (agriculture, trades and industry, and home economics), who could enroll in the programs, the number of hours to be spent in instruction, the qualifications required for instructional personnel, and the amount of supervised time to be spent in the field. Funds could be spent for the salaries of teachers in all three occupational categories, and for the salaries of supervisors and directors of programs in vocational agriculture. Provisions were included requiring the states to create or to designate a state board of vocational education, consisting of not less than three members, if they wished to be eligible for funds. Additionally, the law required each state to prepare a plan for the review of the Federal Board for Vocational Education which was also created in the legislation (Cuban, 1982:48).

The Smith-Hughes Act provided a continuing appropriation for distribution to the states beginning with $1,660,000 and increasing gradually each year until a total of $7,167,000 was reached in 1926 and annually thereafter. This act is one of the few bills passed by Congress in which the authorization and the appropriation were together in the original law so that there was no need for an annual appeal to Congress for funds. The act ultimately included $3,000,000 for agricultural education. The act stipulated dollar-for-dollar matching by state and/or local funds. The federal funds for agricultural education were to be distributed to the states on the basis of their rural population as a percentage of the nation's total rural population.

Vocational education legislation passed during the years of 1929-1946 supplemented the federal contribution to vocational education originated by the Smith-Hughes Act, by increasing federal funding, but made few changes to the programs created by the act. The George-Reed Act of 1929 authorized an annual appropriation for a period of five years. The sum of $500,000 was authorized for the first year, and this amount was increased by $500,000 each year until the maximum of $2,500,000 was reached. These amounts were divided equally between home economics and agricultural education. The allocation of funds for agricultural education under the George-Reed Act was on the basis of farm population rather than on rural population as provided in the Smith-Hughes Act. The George-Ellzey Act of 1934 authorized $1,000,000 for agricultural education for each of the fiscal years ending in 1935, 1936 and 1937. The monies were to be allocated on the basis of farm population, and the act contained no specific provision for teacher training.

The George-Deen Act of 1936, passed during the time while the United States was still trying to recover from the effects of the Great Depression, not only continued and expanded support for the current program of vocational education, but also included federal monies for distributive education. This act authorized $4,000,000 yearly for agricultural education and, because of the economics conditions at the time, provided a sliding scale for matching federal funds for the first five years.

The George-Barden Act of 1946 increased the appropriation for agricultural education as specified in the George-Deen Act to $10,000,000 and provided for more flexibility in the use of these funds. "The chief characteristic of the George-Barden Act as contrasted with previous vocational education legislation was flexibility. Some of the specific limitations on the use of funds were omitted from this act and provisions were included to allow for new phases of work" (Swanson, 1966:90). This act provided legitimate status for certain activities previously developed under administrative approval such as the supervision of the Future Farmers of America and the New Farmers of America, by teachers of agriculture. The act made no specific allocation of funds for teacher training or for vocational guidance, but each state board for vocational education was permitted to use such amounts for these purposes as was deemed necessary.

Since the beginning of vocational education in agriculture, and up to 1963, the guiding aim had been to train "present and prospective farmers for proficiency in farming" (Walsh and Selden, 1965:112). As originally conceived under the Smith-Hughes legislation, vocational agriculture was administered and supported cooperatively by local school districts, the states, and the national government. The programs offered had to meet certain standards as to facilities, programs, and qualifications of instructors as originally prescribed in the individual state plans for vocational education. These programs traditionally served three groups: (1) in school youth preparing to farm, (2) out-of-school young men engaged in farming, and (3) adult farmers fully established as operators either as owners or as tenants (Phipps and Cook, 1956:19). Classes in the public junior and senior high schools were developed for farm youth. Part-time (young farmer) classes were designed to meet the needs of youth who had left the full-time school and were in the process of becoming established in farming. Evening classes or adult classes were first established for adult farmers who were engaged in farming. Three components typically comprised the instructional process. These were classroom instruction, supervised farming activities, and involvement in a youth organization for students in vocational agriculture.

The need for the Vocational Education Act of 1963 originated in the perceived shifting manpower needs of the late 1950s and early 1960s. High unemployment among untrained workers and changes in technology brought demands for the training of workers in occupations not covered by the existing program of vocational education. In the fall of 1961, President John F. Kennedy appointed the Panel of Consultants on Vocational Education to review and evaluate the current National Vocational Education Acts and to make recommendations for improving and redirecting the programs. The Panel found two significant shortcomings in vocational education. First, the Panel reported that the vocational education program had been insensitive to the needs of various groups within the population, and second, the program had been insensitive to labor market needs (U.S. Department of Health, Education, and Welfare, 1963:xv). The Panel found that post-secondary programs had been neglected even though technological changes called for sophisticated training. Moreover, the Panel believed that lack of funding prohibited vocational programs from being developed and that federal support was needed to assure the quality of vocational education services at all grade levels, for all types of students, and for all occupational training programs. Additional areas needing attention included teacher education, curriculum and instructional materials, research, and equipment.

The passage of the Vocational Education Act of 1963 represented a basic shift and expansion of federal assistance to vocational education. The Act redirected vocational education programs from that of specific training categories such as agriculture, home economics, and practical nursing, to that of preparing all groups in the community regardless of their vocational emphasis or attachment to the labor force by eliminating categorical funding of specific program areas. The act was designed to assist those persons who had difficulty in succeeding in regular vocational education programs because of socioeconomic or academic reasons. It did not abolish the Smith-Hughes or George-Barden Acts. For sentimental reasons, vocational educators had wanted to keep these acts in effect. It did, however, modify the two acts by allowing the transfer of funding from the previously established categories.

The Vocational Education Act of 1963 specified no occupational categories but designated that business and office occupations should be included. It broadened the definition of vocational and technical education. It permitted the use of federal funds for the first time to support the purchase of equipment and the construction of area vocational centers. Cooperation between state vocational agencies and state employment services was required, as was the periodic review of administration and programs at the state and national levels (Swanson, 1966:108-109).

The 1963 legislation contained two provisions specifically related to federally funded programs in vocational agriculture. Prior to the passage of the Vocational Education Act of 1963, the main objective of vocational education in agriculture was to prepare present and prospective farmers. The Vocational Education Act of 1963 expanded the purpose of agricultural education to that of preparing individuals for any occupation involving knowledge and skills in agricultural subjects, whether or not such occupation involved the work of the farm or of the farm home. The broadening of the purpose of agricultural education caused attention to be directed to new emerging off-farm occupations and was found to have had far-reaching implications for agricultural education.

The second change for federally funded programs in vocational agriculture was elimination of the requirement for six months of supervised or directed practice on a farm as stated in the Smith-Hughes Act. States and school districts could continue to require supervised farm practice, or an adaptation of the supervised practice, but it was no longer necessary to have it to secure funding.

The Vocational Education Act of 1963 contained many provisions, in addition to those mentioned above, for vocational education as a whole, which affected agricultural education. The following is a list of outcomes believed to be a result of the passage of the act:

1. The aims and objectives of vocational agriculture were broadened to include training for any occupation involving knowledge and skills in agriculture.

2. Federal funding for agricultural education rose 90 percent from $13,699,567 in 1963 to $26,008,434 in 1969.

3. Expenditures for research in agricultural education where federal funding was involved increased 1,425 percent from $20,000 in 1963 to $305,000 in 1969.

4. Expenditures for instructional equipment involving federal funding increased 4,358 percent from $100,000 in 1963 to $4,458,000 in 1969.

5. Agricultural occupations were classified into major instructional areas which included: (1) production agriculture, (2) agricultural mechanics, (3) agricultural supplies, (4) agricultural products, (5) agricultural resourses, (6) forestry, (7) ornamental horticulture, and (8) other agriculture.

6. Curriculum was restructured to accommodate the new areas of agriculture.

7. The addition of off-farm programs increased the participation of females in vocational agriculture courses.

8. Enrollments in production agriculture programs declined from 93.5 percent of the total enrollment in 1965 to 68.8 percent in 1970.

9. Enrollments in secondary vocational agriculture programs increased 6.6 percent from 1965 to 1970.

10. Post-secondary programs were federally funded for the first time under the provisions of the act, and enrollments increased 1,038 percent from 2,054 in 1965 to 23,381 in 1970.

11. Young farmer and adult programs continued to be offered under the provisions of the new act. However, enrollments decreased 24 percent from 367,287 in 1965 to 278,779 in 1970.

12. The total vocational agriculture enrollment combined decreased 3.9 percent from 887,529 in 1965 to 852,983 in 1970.

13. The supervised experience program was expanded to provide supervised occupational experiences in off-farm occupations.

14. The objectives of the FFA and its contests and awards program were revised to accommodate the broadened programs.

15. Membership eligibility in the FFA was expanded to include females enrolled in secondary programs of vocational agriculture.

CONCLUSIONS/RECOMMENDATIONS

The emphasis of the Vocational Education Act of 1963 was on providing and improving general job skills for youth and adults, not on preparing them for specific occupations. The act broadened and expanded programs offered in vocational agriculture in the public schools of the United States. The act allowed vocational training to be offered to students not previously served in agriculture programs, such as females, students with special needs, and students with non-farm backgrounds. The act greatly increased funding for agricultural education and placed emphasis on program development based on research.

Based on the findings of this investigation and the conclusions derived therefrom, the following recommendations are suggested:

1. Additional historical studies should be made in the field of agricultural education so that a broader understanding of the past may be accomplished and direction for the future may be provided. Some areas of study might be:

    a. The history of the project method in vocational agriculture.

    b. An investigation into the writings of particular individuals who have had a major impact on the field.

    c. The history of various components of the FFA such as the judging contests.

   d. A more intensive study of female enrollments in programs of vocational agriculture and the FFA.

2. Economic impact studies of the effect of the Vocational Education Act of 1963 on agricultural education in general should be made.

3. Intensive studies of the effect of the Vocational Education Act of 1963 on adult education in agriculture should be made.

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The Impact of the Vocational Education Act of 1963
on Agricultural Education
A Critique

Glen C. Shinn, Mississippi State University -- Discussant

This research proposed a fresh examination and a critical inquiry of the impact of PL 88-210 using historical research techniques. I believe it has fulfilled the proposal. In recent years, there has been a dearth of historical research which developed a conceptual framework from which to build programs. We must develop this facet of inquiry if we are to plan programs which meet the needs of a contemporary society.

STRENGTHS OF THE RESEARCH. The paper included review of the early legislation which preceded PL 88-210. It provided insight into the social and economic environments which shaped the Act of 1963. The discussion examined the broadening purposes of vocational agriculture and the attention to "...the needs of various groups within the population, and second, the ...labor market needs." The review reminded us that "...postsecondary programs had been neglected even though technological changes called for sophisticated training." It leaves us with the nagging question of a vacuum in nature.

LIMITATIONS OF THE RESEARCH. Educational change is often a very slow, evolutionary process. This inquiry focused on a seven year period following 1963. The time parameter may have limited the assessment of the full impact of PL 88-210. Too, I would like to also view the funding increases with an adjustment for inflation.

As a reader, I am concerned about the possible conflict of interpretation with outcome number 5, "...agricultural occupations were classified into (8) major instructional areas..." and a conclusion that the emphasis of PL 88-210 "...was on providing and improving general job skills for youth and adults, not on preparing them for specific occupations." Has this been a contradiction in the purposes of our program which has detered our progress in planning programs?

SUMMARY. I believe we should plan educational programs using a window to the future rather than a mirror on the past. However, we must be fully aware of the cultural, economic, philosophical, political and social environments which have and will continue to shape our mission. I would like to thank Drs. Crawford and Cooper for their analysis of the impact of PL 88-210.

THE PERSONAL, EDUCATIONAL, AND OCCUPATIONAL BENEFITS RECEIVED BY PARTICIPANTS IN THE NATIONAL FFA CONTEST PROGRAM

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INTRODUCTION

One method used by agricultural educators as a mechanism to motivate students to perfect and advance their occupational skills is competitive events. Competition between agriculture students has taken place since the turn of the century, with the FFA sponsoring such events since 1937 (Tenney, 1977). The FFA contests have expanded over the years to include competition in nine technical events: agricultural mechanics, dairy cattle, farm business management, floriculture, livestock, meats, milk quality and dairy foods, nursery/landscape, and poultry.

The benefits to students derived from these competitive events have long been accepted by agricultural educators as meriting the time, effort, and costs necessary to conduct them, even though no empirical evidence existed to support this assumption. Other than brief evaluations immediately following the actual contests, no formal evaluation of the national contest program had ever been conducted. It was the purpose of this research to provide some information on the benefits: personally, educationally, and vocationally received by contest participants.

PURPOSE AND OBJECTIVES

The purpose of this study was to determine to what extent contest participants had benefited from their national contest judging experiences. This research was designed to answer the following questions: (1) To determine the personal and occupational benefits participants received; (2) to determine the post-secondary educational advantages contest participants received; and (3) to determine if contest participants were employed or preparing for employment in the capacity for which they were trained.

PROCEDURES

As no previous studies had been conducted in this area, the research was exploratory in nature. A correlational design was employed, with selected causal-comparative statistical techniques applied where appropriate.

The population for this study consisted of the participants from all national FFA contests for the years 1979, 1980, and 1981. The study did not include years prior to 1979 as home addresses of participants were not collected before that year. Contestants who had participated in national contests after 1981 were excluded from the study as the research was designed to study participants who had completed their secondary education.

A selection of subjects for the study was made from a computer-generated list of names and addresses. Systematic sampling was used to obtain the sample from the defined population. Systematic sampling is an appropriate technique to employ for sample selection if one is certain that the population list is in random order--that is, if every (n)th person on the list does not share a common characteristic (Borg, 1983). Sample size was determined by following guidelines suggested by Garrett (1967). As a low response rate was anticipated because of the length of time that had transpired between the initial collection of the participants' addresses and the time of the collection of the data for this study, substitutes for nonrespondents were selected using procedures outlined by Chapman (1983).

The instrument used to gather data for this investigation was developed by the researcher. To ensure the validity of the instrument, it was reviewed by a panel of experts. The suggestions of the reviewers were incorporated into a revised instrument, which was subsequently field tested for reliability with a group of national contest participants not selected as a part of the sample. Responses from the field test were coded and analyzed for reliability by computing Cronbach's Coefficient Alpha. The total instrument reliability was .82, with all individual concept measures having reliability coefficients greater than .90. Reliability coefficients of this magnitude were considered to be quite adequate for an instrument of this type and no modifications were made to the questionnaire prior to its eventual mailing.

Data were collected by mailing the questionnaire to the 225 selected subjects and 299 substitutes. Follow-up letters were sent to the nonrespondents from both groups. A random sample of nine nonrespondents (10%) was interviewed by telephone. No significant differences were noted between respondents and nonrespondents. Table 1 summarizes the survey response rate.

Table 1.

	Number sampled	Number responding	Percent responding	Number unusable	Percent unusable	Total usable
Subjects	225	138	61.33%	1	0.72%	137
Substitutes	299	171	57.19%	0	0.00%	171
Totals	524	309	58.97%	1	0.32%	308

RESULTS

Personal Benefits

Respondent attitudes concerning the benefits they received from participation in the contests were measured by having the students react to 15 benefit statements. A five point Likert-type scale was used with responses coded as: 1 = none, 2 = little, 3 = some, 4 = much, 5 = very much. Data in Table 2 summarize the mean response scores for each statement.

Participants believed they received the greatest benefits on measures of interpersonal benefits. The contests help in creating "self-confidence" received the highest mean score ($\bar{x}=4.20$). This was followed by another interpersonal benefit, "improving self-esteem," which had a mean score of 4.01. Both of these measures had small standard deviations when compared to other benefit statements. The benefit statement receiving the lowest score

Table 2.

Statement of benefit	Mean	SD
The contests helped me to:		
choose an occupation	2.96	1.25
develop my self-confidence	4.20	0.80
develop an interest in learning	3.98	0.90
set my educational objectives	3.21	1.11
improve my communication skills	3.69	1.14
improve my computational skills	2.85	1.14
become more employable	3.33	1.22
improve my self-esteem	4.01	0.91
improve my social status and prestige	3.37	1.16
improve my ability to relate to others	3.81	1.06
develop hobbies and leisure activities	3.20	1.30
improve my leadership skills	3.96	1.06
gain occupational skills and competencies	3.68	1.08
develop my problem-solving skills	3.66	1.06
improve my decision-making skills	3.97	0.96

was in the area of improvements to the competitor's computational skills ($\bar{x}$=2.85).

The fifteen benefit statements were examined by factor analysis using the principle components method with varimax rotation. Three factors were identified and are summarized in Table 3. The three benefit factors were labeled as (1) interpersonal, (2) skill development, and (3) goal setting. Transformed scores (factors) were computed and analyzed by one-way analysis of variance and t-test procedures. Duncan's multiple range test was used to ascertain where differences in means existed. No significant differences in means for the three factors were determined to exist between participants by sex. In addition, no differences in variances were found among group means when compared by: academic ability, SOE type, FFA degree, FFA office, or semesters of vocational agriculture enrollment.

Significant differences in means were found to exist among contest areas on measures of interpersonal benefits at the .01 level. Participants from Dairy Cattle, Livestock, Dairy Products, Floriculture, and Poultry all had significantly higher scores than did contestants in the Farm Business Management and Agricultural Mechanics contests. These differences are depicted in Table 4.

Participant performance in the contest had an impact on measures of benefits received. Contestants receiving gold placings had significantly higher mean scores on measures of skill development than did participants receiving a bronze or silver participation. An advantage in goal setting was found for participants earing a gold or silver ranking (Table 5).

Educational Benefits

Two groups were formed to measure the post-secondary educational benefits that participants received from having judged in the national contests. The groups consisted of those that had completed their formal education and

Table 3.

Factor item	Loading
Factor 1: (Interpersonal Benefits)	
improve my communication skills	0.79
improve my ability to relate to others	0.77
improve my leadership skills	0.66
develop an interest in learning	0.65
develop my self-confidence	0.64
develop hobbies and leisure activities	0.59
improve my social status and prestige	0.43
Factor 2: (Skills Development)	
develop my problem-solving skills	0.82
improve my decision-making skills	0.70
improve my computational skills	0.59
gain occupational skills and competencies	0.58
become more employable	0.55
improve my self-esteem	0.53
Factor 3: (Goal Setting)	
choose an occupation	0.80
set my educational objectives	0.78

Table 4.[a]

Contest	Contest[b]								
	1	2	3	4	5	6	7	8	9
1. Agricultural Mechanics[c]									
2. Dairy Cattle	x		x			x			
3. Farm Business Management									
4. Floriculture			x						
5. Livestock	x		x			x			
6. Meats									
7. Dairy Products	x		x						
8. Nursery/Landscape									
9. Poultry	x		x						

[a] Factor loadings explained in Table 3.

[b] Contests: 1 = Agricultural Mechanics, 2 = Dairy Cattle, 3 = Farm Business Management, 4 = Floriculture, 5 = Livestock, 6 = Meats, 7 = Dairy Products, 8 = Nursery/Landscape, 9 = Poultry.

[c] Row means are significantly higher than column means.

those that had not. The group that had completed their formal schooling accounted for 39% of the 225 subjects sampled.

Both groups were asked to respond to two questions concerning their post-secondary education: (1) to estimate the relationship of their post-secondary education to their contest training, and (2) to estimate the degree to which their contest training had benefited them in their post-secondary education. The combined group responses to the question that established the relationship of post-secondary education to contest training had a mean value of 6.40, with a one representing "no relation" and

Table 5.

Benefit factor[b]		Total	Contest ranking[a]				F-value	F-prob.
			1	2	3	4		
			n=225	n=74	n=71	n=37	n=43	
Interpersonal	M[c]	17.07	17.50	17.36	15.73	17.00	2.31	.076
Benefits	SD[d]	3.55	3.54	3.46	3.76	3.38		
Skills		13.59	14.24	13.71	12.77	12.98	2.76*	.043
Development		3.01	2.66	2.93	3.16	3.36		
Goal		4.87	5.13	5.08	4.87	4.05	4.70**	.003
Setting		1.67	1.54	1.75	1.57	1.60		

[a] Ranking key: 1 = Gold, 2 = Silver, 3 = Bronze, 4 = Participation.
[b] Factor loadings explained in Table 3.
[c] M = Group mean.
[d] SD = Standard deviation.
*Significant at the .05 level.
**Significant at the .01 level.

eleven a "close relation." The composite mean value on the benefit measure was 6.95, with a one representing "no benefit" and eleven "great benefit" (Table 6).

Table 6.

Benefit and relationship measures		Total	Groups		t-value	t-prob.
			Completed education	Still in school		
		n=182	n=45	n=137		
Relationship of contest training to education	M[a] SD[b]	6.40 3.04	6.31 3.27	6.43 2.96	-0.51	.614
Benefit of contest training to education		6.95 2.41	6.42 2.97	7.12 2.23	-1.45	.151

[a] M = Group mean.
[b] SD = Standard deviation.

Occupational Use of Contest Skills

One of the major objectives of this study was to determine the degree to which participants were employed or preparing for employment in contest-related occupations. Those participants that had held full-time positions (employed at least 40 hours weekly), or had been self-employed were asked to respond to four Likert-type questions to determine: (1) the relationship of their contest training to their current employment or business, (2) the extent to which they had ever used the contest skills in an employment or business situation, (3) the extent to which they believed the contest skills would be advantageous to their employers or businesses in the future, and (4) the extent to which their contest skills had been beneficial to them in securing employment or business opportunities.

Several tests were conducted to determine if significant differences among means existed in response to the above questions. When grouped according to selected factors, no significant differences in F-values could be determined for the following group differences: age, location of residence, semesters of vocational agriculture enrollment, FFA degree held, FFA office held, supervised occupational type and category, or by contest ranking.

Highly significant differences in means between sexes were found to exist for three of the four measures of occupational advantages when the data were analyzed by use of t-tests. Males believed they received more advantage when it came to the use of their skills in occupations. The lowest scores for females were found on measures to determine the relationship of their contest training to their current occupations ($\bar{x}=4.53$). Males and females perceived similar advantages in obtaining employment from having participated in the contests. Table 7 summarizes these findings.

Table 7.

Occupational advantage	Total	Group		t-value	t-prob.
		Males	Females		
	n=172[a]	n=125	n=47		
Relationship of contest training to[b]	M[c]	6.31	4.53	3.34**	.001
current employment	SD[d]	3.21	3.08		
Degree to which contest skills have[e]		7.28	5.85	2.96**	.004
been used in employment situation		2.84	2.81		
Degree to which contest skills will[f]		7.48	6.13	2.53*	.014
be valuable to employer in the future		2.87	3.20		
Degree to which contest skills have[g] been beneficial in obtaining employment		7.02	6.32	1.45	.151

[a] Only those respondents who had been full-time employees or self-employed completed these instrument items.

[b] Scale ranged 1 to 11 with 1 representing "no relation," 11 "close relation."

[c] M = Group mean.

[d] SD = Standard deviation.

[e] Scale ranged from 1 to 11 with 1 representing "never," 11 "frequently."

[f] Scale ranged from 1 to 11 with 1 representing "no value," 11 "great value."

[g] Scale ranged from 1 to 11 with 1 representing "no benefit," 11 "large benefit."

*Significant at .05 level.

**Significant at .01 level.

Significant differences in F-values were found to exist at the .05 level among the different contest areas. A summary of those findings can be found in Table 8. Duncan's multiple range test was employed to ascertain which contests had significantly different means. Differences were found to exist on the measure of the relationship between their current position and their contest training. Participants from the Agricultural Mechanics, Livestock, Dairy Cattle, Farm Business Management, and Dairy Products contests all held

Table 8.

Occupational advantage score		Total	Contest[a]									F-value	F-prob.
			1	2	3	4	5	6	7	8	9		
		n=172	n=23	n=23	n=20	n=20	n=22	n=13	n=17	n=17	n=17		
Relationship of contest training to current employment	M[b]	5.83[c]	7.39	6.61	5.90	5.35	7.23	5.08	5.88	4.18	3.14	3.55**	.000
	SD[b]	3.27	3.07	3.07	3.11	3.72	2.33	2.75	3.14	3.80	2.45		
Degree to which contest skills have been used in an employment situation		6.89	8.30	7.13	6.70	6.60	7.55	6.69	6.00	6.59	5.71	1.50	.159
		2.90	2.58	3.03	2.23	2.74	2.56	2.84	3.30	3.71	2.73		
Degree to which contest skills will be valuable to employer in ten years.		7.11	6.69	8.09	7.70	6.60	8.00	6.31	6.76	6.12	6.65	1.15	.334
		3.01	2.97	2.64	2.87	2.95	2.25	2.39	3.17	4.36	3.18		
Degree to which contest skills have been beneficial in obtaining employment		6.83	6.43	8.09	6.10	6.30	7.82	5.69	7.24	7.35	5.76	1.97	.053
		2.84	3.10	2.09	2.75	2.77	2.30	2.78	2.75	3.90	2.33		

[a] Contests: 1 = Agricultural Mechanics, 2 = Dairy Cattle, 3 = Farm Business Management, 4 = Floriculture, 5 = Livestock, 6 = Meats, 7 = Dairy Products, 8 = Nursery/Landscape, 9 = Poultry.

[b] M = Group mean.

[c] Scale described in Table 5.

[d] SD = Standard deviation.

**Significant at the .01 level.

positions more closely related to their contest training than did contestants from the Poultry contest. In addition, contestants from the Agricultural Mechanics, Livestock, and Dairy Cattle contests had significantly higher means than Nursery/Landscape participants. No significant differences in variance by contest area could be determined for the other three measures of occupational advantages received by participants (Table 8).

CONCLUSIONS AND RECOMMENDATIONS

The national FFA judging contests have been an event of considerable controversy since their inception. How effective they had been in support of the vocational mission of the total vocational agriculture program was unknown; prior to this study, no information existed to validate or invalidate their educational value. The most important benefits participants believed they received from having participated in the national contests were interpersonal. They ranked contributions to their self-confidence and self-esteem as the top two benefits. While these benefits are admirable and supportive of the objectives of the FFA (Future Farmers of America, 1985), judging contests may not be the most appropriate medium for satisfying these objectives.

The written educational objectives for conducting the national contests emphasize the vocational skills developed by the participants. The national contestants represent the most skilled, best trained, vocational agriculture students from each state in the nation. If the purpose of the vocational agriculture program is to prepare students for employment, then the students participating at the national level do not reflect that mission. It would appear that either the objectives of the national FFA contests need to be changed to better reflect the benefits the participants are receiving, or the contests need to be dropped in favor of other, more effective educational delivery methods.

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The Personal, Educational, and Occupational Benefits Received by Participants in the National FFA Contest Program

A Critique

Robert J. Birkenholz, University of Missouri--Discussant

The study conducted by Gamble examines a component of agricultural education which has become the subject of much controversy. Benefits of student participation in FFA sponsored contests have been questioned by both advocates and critics of vocational agriculture. The purpose of this study was to ascertain student-perceived benefits of participation in such activites at the national level.

Some of the major strengths of the study were:

1. The researcher should be commended for having the courage to attempt to ascertain benefits derived from participation in national FFA contests.
2. The central problem of the research effort was clearly stated as was the need for the study.
3. Objectives developed to guide the research activities were clearly stated and appropriate to fulfill the purpose of the study.
4. Procedures for instrument development, validation, estimating reliability and following-up nonrespondents were commendable.
5. It appeared that sample selection procedures were appropriate for the population identified.
6. The inclusion of substitute respondents appeared to be appropriate for this study; however, a more detailed secription of which substitutes were included and on what basis would have been beneficial.

During a review of the research paper, several questions emerged which limited the reader's ability to adequately evaluate the results which were presented. Some of the major concerns were:

1. When were the data collected? Could some of the respondents have been in high school while others were in college?
2. How were factor scores computed and analyzed using ANOVA and t-test procedures?
3. How did group mean comparisons for selected student characteristics contribute to fulfillment of the objectives outlined in the study?
4. Why were table titles omitted?
5. How did comparing the nine different contest areas contribute to the objectives of the study? Was the intent to evaluate individual contests or the national contest program in general?
6. Why was the occupational advantage factor reported by sex classification? Was the use of multiple t-tests appropriate? Is there a possibility of interitem correlation among the four statements relating to occupational advantage?
7. Was it appropriate to recommend changing contest objectives or dropping the contests when the research was described as "exploratory in nature"?

The results of this study indicate the need for further research concerning the intended and realized benefits of student participation in FFA contest activities.

THE PROFESSIONAL COMPETENCIES NEEDED BY INTERMEDIATE AGRICULTURAL EXTENSION PERSONNEL IN THE KENYA AGRICULTURAL EXTENSION SERVICE

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INTRODUCTION

Intermediate agricultural education and training are vital for developing Kenya rural areas. It is through education and training programs that rural change agents are equipped with knowledge and skills which they need in order to transform rural areas.

The Weir Commission Report on Agricultural Education (1967) emphasized that intermediate education for agricultural extension personnel produces people who understand and are skilled in the most up-to-date practical methods. According to the Food and Agricultural Organization Report (1970:103), the essential purpose of intermediate level training is to prepare people for employment as technicians in a wide range of skilled occupations. This implies that the educational emphasis must be on practical application and the technician must aim at understanding the basic principles underlying modern methods in the chosen skill as well as acquiring technical and managerial ability. The curriculum for training intermediate agricultural extension personnel, therefore, needs to adapt to the needs of extension agents. Intermediate courses must not aim at training people who, at the conclusion of their course, will want to seek a "white collar" job. Rather it should emphasize the practical contribution which the personnel have to make to rural development. Those courses should be planned to help the personnel to understand the virtues of the critical grassroots work which they will be doing.

Specifically, the following two questions need to be considered when planning agricultural training programs:

1. What to extend to farmers? This includes knowledge of technical subjects.

2. How to extend agricultural knowledge and skills to farmers?

The implication of the above questions to trainers is that both technical and professional competencies needed by intermediate agricultural extension personnel should be identified and included in the training programs.

PURPOSE AND OBJECTIVES

The primary purpose of this study was to describe the perceptions of technical officers, district agricultural officers, and trainers regarding the professional competencies needed by the intermediate agricultural extension personnel in the Kenya Agricultural Extension Service.

The following specific objectives were developed to provide a framework for conducting this study:

1. To describe perceptions of technical officers, district agricultural officers, and trainers regarding the importance of professional competencies needed by intermediate agricultural extension personnel in Kenya.
2. To compare the perceptions of technical officers, district agricultural officers, and trainers regarding the importance of professional competencies needed by intermediate agricultural extension personnel.

To facilitate the analysis of data the following null hypothesis was formulated. There are no significant differences among the perceptions of technical officers, district agricultural officers, and trainers regarding the importance of professional competencies needed by intermediate agricultural extension personnel.

PROCEDURES

The target population of this study consisted of technical officers, district agricultural officers, and trainers. Random samples were drawn from the above populations using both cluster and stratified sampling techniques.

Technical officers and district agricultural officers were stratified by province. A total number of 20 districts was selected from the provinces using a table of random numbers. All the technical officers in these 20 districts were included in the study. A total of 200 technical officers and 30 district agricultural officers was finally identified. The proportional stratified sampling technique was used in selecting 120 trainers from Egerton College and Jomo Kenyatta College of Agriculture and Technology.

An initial questionnaire was developed and validated using a panel of 13 experts from Egerton College. The revised questionnaire was pilot tested using a sample of 22 trainers and agricultural extension workers undergoing training in the United States. The pilot instrument was tested for its reliability using Cronbach's coefficient alpha. The final questionnaire consisting of 14 biographical questions and 111 professional competencies was adapted and mailed to each of the subjects.

ANALYSIS OF DATA

Descriptive statistics were used to analyze data pertaining to the ratings of the importance of professional competencies by the three groups of respondent. Mean scores and standard deviations were obtained for each of the professional competencies. Objective two and the hypothesis were further analyzed using one-way analysis of variance. An F statistic was calculated to determine which competencies were perceived significantly different by the three groups of respondents. Scheffe Multiple Range Test was employed to distinguish which groups were significantly different in rating the importance of professional competencies.

RESULTS

The respondents were asked to rate the importance of a list of 111 professional competencies needed by intermediate agricultural extension personnel. The professional competencies were categorized into administration, program planning, program execution, teaching, communication, understanding human behavior, maintaining professionalism, evaluation, and 4-K youth.

It was found that most of the competencies were considered by the three groups of respondents to be of high importance in operating agricultural extension programs. Only one of the competencies in the communication category was rated as being if moderate importance.

The hypothesis, which stated that there are no significant differences among the perceptions of technical officers, district agricultural officers, and trainers regarding the importance of the professional competencies, was rejected for 17 of the 111 professional competencies. The 17 competencies for which the hypothesis was rejected are summarized in Tables 1 through 5.

One-way analysis of variance and Scheffe Multiple Range Test revealed that the competency "prepare job description for staff" in administration, and the competency "prepare a long range program of work" in program planning were rated significantly different in importance by the three groups of respondents. The two competencies were rated significantly lower by technical officers as compared to the trainers (Table 1).

Table 1. Mean Scores and Standard Deviations Obtained from the Perceptions of Technical Officers (TOs), District Agricultural Officers (DAOs), and Trainers for Competencies Rated Significantly Different in Administration and Program Planning.

Group	n	C17 (Administration)		C5 Program Planning)	
		x	SD	x	SD
Technical Officers	167	4.06A	0.95	3.48A	1.04
District Agricultural Officers	18	4.22AB	0.88	3.50AB	1.15
Trainers	86	4.41 B	0.76	3.88 B	0.87

Means of groups followed by the same letter are not significantly different from each other based on the Scheffe Multiple Range Test, $p<0.05$.

Note: C17--Prepare job description for staff you supervise ($F=4.32$; $p<.01$)
C5 --Prepare a long-range program of work ($F=4.65$; $p<0.01$)

One-way analylsis of variance revealed that four competencies in program execution were rated significantly different in importance by the three groups of respondents. Scheffe Multiple Range Test indicated that the competency "utilize a calendar of events" was rated significantly lower by the district agricultural officers as compared to the other two groups of respondents. The competencies "follow a written program of work" and "select progressive farm cooperators for trial and result demonstrations" were rated by the three groups of respondents in the same way (Table 2).

One-way analysis of variance and Scheffe Multiple Test showed that four professional competencies in the teaching category were rated significantly different in importance by the three groups of respondents. The competencies "develop and use instructional materials," "employ principles of learning and teaching," and "employ good feedback techniques" were rated significantly higher by the trainers as compared to the district agricultural officers (Table 3).

The competencies "communicate orally to individuals" and "deal with complaints in communities" were rated significantly lower in importance by the district agricultural officers as compared to the other two groups of respondents. The competency "develop a plan for professional development" in maintaining professionalism was rated significantly higher by the trainers than the district agricultural officers (Table 4).

One-way analysis of variance and Scheffe Multiple Range Test revealed that there were four competencies in evaluation which were rated significantly different by the three groups of respondents. The competency "analyze and interpret results from questionnaires" was rated significantly higher by the trainers. The two competencies "evaluate results of an extension event or activity" and "interpret research findings from research stations" were rated significantly lower in importance by district agricultural officers as compared to the ranking of the trainers.

CONCLUSIONS

The following conclusions and implications were made based on the findings of this study.

1. The three groups of respondents rated most of the identified professional competencies as being of high importance. Only three competencies were considered to be of moderate importance. It can, therefore, be concluded that the respondents considered all the professional competencies included in the study to be important and relevant in implementing agricultural extension programs by the intermediate agricultural extension personnel in Kenya. This implies that these professional competencies should be taught to this category of personnel.

2. The three groups of respondents rated the importance of the 17 professional competencies significantly different. This implies that there was no general agreement among the respondents concerning the importance of the 17 professional competencies in operating agricultural extension programs. The curriculum planners in the

Table 2. Mean Scores and Standard Deviations Obtained from the Perceptions of Technical Officers (TOs), District Agricultural Officers (DAOs), and Trainers for Competencies Rated Significantly Different in Program Execution - C1.

		C1		C2		C8		C10	
Group	N	X	SD	X	SD	X	SD	X	SD
Technical Officers	167	4.16A	0.85	4.06A	0.97	4.33A	0.79	4.08A	1.00
District Agricultural Officers	18	3.56 B	1.04	3.22	1.17	4.22AB	0.81	3.44 B	1.10
Trainers	86	4.19A	0.82	4.10	0.89	3.96 B	0.98	4.08A	1.00
Total	271	3.97	0.90	3.80	1.01	4.17	0.86	3.87	1.03

Means of groups followed by the same letter are not significantly differently different from each other based on the Scheffe Multiple Range Test, p<.0.05.

Note: C1 - Utilize a calendar of events (F=4.39; p<0.013)
C2 - Follow a written program of work (F=6.70; p<.001)
C8 - Identify and use early adopters or opinion leaders in extension programs (F=5.34; p<0.005)
C10 - Select progressive farm cooperators for trial and result demonstrations (F=3.14; p<0.035)

Table 3. Mean Scores and Standard Deviations Obtained from the Perceptions of Technical Officers (TOs), District Agricultural Officers (DAOs), and Trainers for Competencies Rated Significantly Different in Teaching - C2, C3, C4, and C12.

		C2		C3		C4		C12	
Group	N	X	SD	X	SD	X	SD	X	SD
Technical Officers	167	3.99AB	0.90	4.01AB	0.84	4.09A	0.89	4.16AB	0.79
District Agricultural Officers	18	3.83A	0.71	3.89A	0.96	3.61A	1.19	4.00A	0.84
Trainers	86	4.36 B	0.88	4.34 B	0.90	4.41 B	0.84	4.39 B	0.82
Total	271	4.06	0.83	4.08	0.90	4.04	0.97	4.18	0.82

Means of groups followed by the same letter are not significantly differently different from each other based on the Scheffe Multiple Range Test, p<.0.05.

Note: C2 - Employ principles of learning and teaching (F=5.86; p<0.003)
C3 - Develop and use instructional materials (F=4.72; p<0.009)
C4 - Use non-formel teaching methods (e.g., farm visit) for particular situations (F=7.11; p>0.003)
C12 - Employ good feedback techniques (F=3.27; p<0.039)

Table 4. Mean Scores and Standard Deviations Obtained from the Perceptions of Technical Officers (TOs), District Agricultural Officers (DAOs), and Trainers for Competencies Rated Significantly Different in Communication and Maintaining Professionalism.

Group	N	C2		C6		C10	
		X	SD	X	SD	X	SD
Technical Officers	167	4.00AB	1.02	3.69AB	1.16	4.09AB	0.96
District Agricultural Officers	18	3.61A	0.79	3.61A	1.09	3.61A	0.85
Trainers	86	4.17 B	0.74	4.14 B	0.83	4.24 B	0.85
Total	271	3.81	0.99	3.98	0.89	3.93	0.85

Means of groups followed by the same letters are not significantly different from each other based on the Scheffe Multiple Range Test; $p<0.005$.

Note: C2 - Develop a plan for professional development ($F=2.90$; $p<0.05$)
C6 - Communicate orally to individuals ($F=5.55$; $p<0.004$)
C10 - Deal with complaints ($F=3.58$; $p<0.03$)

Table 5. Mean Scores and Standard Deviations Obtained from the Perceptions of Technical Officers (TOs), District Agricultural Officers (DAOs), and Trainers for Competencies Rated Significantly Different in Evaluation - C6, C7, C8, C13.

Group	N	C6		C7		C8		C13	
		X	SD	X	SD	X	SD	X	SD
Technical Officers	167	3.71A	1.07	4.02AB	1.00	4.22AB	1.02	3.48A	1.11
District Agricultural Officers	18	3.61A	1.04	3.94A	0.80	3.89A	0.90	3.89AB	0.83
Trainers	86	4.09 B	0.80	4.37 B	0.70	4.48 B	0.70	3.92 B	0.90
Total	271	3.80	0.98	4.11	0.83	4.20	0.88	3.76	0.95

Means of groups followed by the same letter are not significantly different from each other based on the Scheffe Multiple Range Test, $p<0.05$.

Note: C6 - Analyze and interpret results from questionnaires ($F=4.70$; $p<0.01$)
C7 - Evaluate results of an extension event or activity ($F=4.57$; $p<0.01$)
C8 - Interpret research findings from research stations ($F=3.95$; $p<0.02$)
C12 - Conduct literature search utilizing library resources ($F=5.52$; $p<0.004$)

intermediate agricultural training institutions should, therefore, examine the philosophical and psychological implications of the 17 competencies which were rejected due to the lack of general consensus among the three groups of respondents. However, it should be noted that for practical purposes these 17 competencies should be considered in planning extension education courses. This is because the three respondent groups rated them to be of "high importance." There was, however, a general agreement among the respondents regarding the importance of the remaining 94 professional competencies.

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The Professional Competencies Needed by Intermediate Agricultural Extension Personnel in the Kenya Agricultural Extension Service
A Critique

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This study sought to evaluate the intermediate education and training for Kenya's agricultural extension service. The perceptions of those who provided, administered, and prepared those two groups of extension personnel were sought regarding the relative importance of 111 professional extension competencies. The strengths of this study lie in the systematic development of the instrument and pilot testing of that instrument. Thirteen expert judges were used as a panel to prepare the instrument.

The respondent group generally agreed with the content contained in the 111 item competency list. They rated 110 items in the "high importance" category with one communications item in the "moderate importance" category. There were differences between groups for 17 of the 111 items; but, within the limited descriptive material pertaining to the scale used, I surmised that the differences were in neighboring, but positive, categories.

The weaknesses of this study can be judged within an assumption of sufficient resources to expand it. With such an assumption, which is probably erroneous with a graduate student, it is possible to dream of a more comprehensive evaluation that seeks farmer input and production measures. I would assume that farmers would provide some sense of whether they have been made to feel a part of the problem solving team. A look at measureable production gains would be of value also.

Demographic information to include the experience background and education of the agents, the principal program direction provided by donors, and the measureable effect that extension has had on improving the livelihood of Kenya farm families should be included before submitting this paper for journal publication. Generalization of the results to other developing countries requires this kind of descriptive information.

VOCATIONAL AGRICULTURE FOR THE YEAR 2000

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INTRODUCTION

Vocational agriculture programs are experiencing a period of change. The provisions of the Carl Perkins Vocational Education Act and the economic crises that continue to plague federal and state governments are again forcing agricultural educators to reexamine where our program should be going.

The national study of agricultural education currently being conducted by the National Institute of Education is attempting to determine what role vocational agriculture programs should play in the future. The study is a result of leaders in the United States Department of Education and the United States Department of Agriculture as well as others in the agricultural education profession realizing that an assessment is needed.

Jones (1980) may have predicted the current emphasis being placed on program planning and evaluation when he wrote that vocational agriculture teachers need to ask four questions about the nature, longevity, and quality of programs of the future. The questions were: whom will we serve, how will we serve, how well will we serve, and how will we be led?

Drake (1982) also cautioned the profession about the expectations held for vocational agriculture teachers when he stated that it is a fantasy to believe that teachers of agriculture can or are willing to carry out the many expectations held for their positions. He also stated that the super person fantasy may be the most serious professional problem facing agricultural education.

Rawls (1980) predicted changes in the vocational agriculture programs of the future when he listed seven factors that would bring about change in the 1980's. His list included pressures for accountability, changing teacher attitudes, population shifts and changing technology.

A need exists to determine the components that should be included in vocational agriculture programs in the future and to determine the factors that need to be addressed to insure that programs of the future are quality programs. This study was based on the theory that vocational agriculture teachers work with the vocational agriculture program on a daily basis. Therefore, they are an appropriate group to provide the information needed.

PURPOSE AND OBJECTIVES

The purpose of this study was to determine vocational agriculture teachers' opinions of the direction that vocational agriculture programs should take in the future. The objectives of this study were as follows:

1. To determine vocational agriculture teachers' opinions of the components that should be maintained in the program in order to have quality programs in the future.
2. To determine vocational agriculture teachers' opinions of the importance of selected external factors in insuring that the vocational agriculture program will continue to be a quality program.

3. To determine if differences existed by the levels of selected demographic variables in the major factors derived from the results of a factor analysis. The variables used in these analyses were size of community (population), number of vocational agriculture teachers in the school, and contract length.

PROCEDURES

A closed-form questionnaire was developed based on a review of the literature. This instrument was reviewed and revised by a team of agricultural teacher educators. The instrument was field tested with 15 teachers who had not been selected to participate in the study and modified based on their comments. Reliability for the two scales in the instrument was assessed using Cronbach's Alpha. The resulting r values were .905 and .892. These data indicated that the instrument possessed internal consistency.

The population consisted of all high school vocational agriculture teachers in the U.S. as listed in the Agriculture Teachers Directory (Henry, 1985). Cochran's sample size formula (Snedecor and Cochran, 1980) was used to select a sample size of 250 from which a return rate of 84.4% (211) was achieved after two mailouts and one phone follow-up.

ANALYSIS OF DATA

Analyses of variance were used to determine if the responses for the 8 factors that resulted from the factor analysis differed among the three response waves. No differences were found and the data were combined for further analyses.

The data were analyzed using descriptive statistics for objectives 1 and 2. Factor analysis and inferential t-tests were used to analyze the data relative to objective 3. Data analyses were conducted using the SPSS-X statistical analysis program (SPSS Inc., 1983). The Alpha level was set at .01.

RESULTS

Importance of Selected Programmatic Components to Future Programs

The teachers in the sample were asked to rate 34 program components on a five point Likert scale according to "how important you feel each of the following components will be to Vo-Ag programs in your community in the year 2000." The five point scale ranged from "1" with a descriptor of "not important" to "5" with a meaning of "extremely important."

The most important components as rated by the teachers were leadership instruction (4.51), record keeping instruction (4.30), farm/agribusiness management instruction (4.19), agricultural mechanics laboratories (4.18), summer programs (4.14), and SOE supervision (4.12). The bottom three components were Vo-Ag computers lab (#34, 3.05), computers for use in managing FFA activities (#33, 3.31), and adult education programs (#32, 3.40). These data are presented in Table 1.

Table 1

Importance of Selected Components to Vocational Agriculture Programs in the Respondents' Local Community for the Year 2000

Rank	Component	Mean[a]	S.D.
1	Leadership instruction	4.51	.69
2	Agricultural record keeping instruction	4.30	.80
3	Farm/agribusiness management instruction	4.19	.97
4	Welding laboratories	4.18	.75
5	Summer programs of vocational agriculture	4.14	.90
6	SOEP supervision	4.12	.79
7	Woodworking laboratories	4.02	.89
8	Computers for use in Vo-Ag program management	4.10	.96
9	Computers for instructional use	4.05	.92
10	Small gas engine laboratories	3.97	.83
11	Agricultural mechanics instruction	3.95	.87
12	Placement SOEPs (Co-op training, internships)	3.93	.90
13	Energy and natural resources instruction	3.92	.96
14	Greenhouses	3.91	.86
15	Farm/agribusiness power and machinery laboratories	3.91	.90
16	Post-secondary programs (junior colleges, vo-tech schools)	3.91	.98
17	Individualized instruction	3.88	.88
18	Competency-based instruction	3.78	.87
19	Ownership SOEPs for Vo-Ag students	3.73	.89
20	Agricultural supplies and services instruction	3.73	.97
21	Electricity laboratories	3.71	.99
22	FFA contests	3.70	.92
23	Animal science instruction	3.69	.97
24	Agronomy instruction	3.67	.97
25	Other plant and soil science laboratories (besides greenhouses)	3.65	1.12
26	Meats/or food processing laboratories	3.64	.91
27	Animal science laboratories	3.64	.95
28	Horticulture instruction	3.61	1.10
29	FFA proficiency awards program	3.55	.86
30	State/American Farmer Degree Program	3.51	.92
31	Land laboratories	3.51	1.00
32	Adult education programs (in high schools)	3.40	1.10
33	Computers for use in managing FFA activities	3.31	1.09
34	Vo-Ag Computers Lab	3.05	1.21

[a] not important = 1, slightly important = 2, moderately important = 3, very important = 4, extremely important = 5

Importance of Selected External Factors to Programs of the Future

The teachers were also asked to rate 29 factors on the same five point Likert scale as used above according to "how important you feel each of the following factors will be in insuring quality Vo-Ag programs in your community for the year 2000." The top three individual factors rated as having an impact on the quality of programs in the future were teacher pay and benefits (4.77), teacher professionalism (4.70), retention of competent teachers in the profession (4.68), quality of new vocational agriculture teachers (4.64), and leadership shown by individual vocational agriculture teachers (4.63). The bottom three factors were national supervision of programs (#29, 2.99), state supervision of programs (#28, 3.67), and school provided facilities for SOE projects (#27, 3.68). These data are presented in Table 2.

Factor analysis was used to extract eight major factors from the 29 factors in the instrument. The eight factor loadings and the individual actors in each factor loading are presented in Table 2. The factor loadings consisted of groupings of factors related to funding, teacher quality, teacher preparation, state and national supervision, public image, support for the SOE program, program administration and instructional materials development. These factors were used as the dependent variables in inferential *t*-tests (using pooled variance). No significant differences existed in any of these factors by contract length (11.5-12 months *vs.* less than 11.5-12 months), number of teachers in the department (1 teacher vs. two or more teachers), and community size (less than 5000 *vs.* 5000 or more population).

CONCLUSIONS AND RECOMMENDATIONS

1. Program components related to the FFA are not highly important components of vocational agriculture programs of the future when compared to the other components addressed. Three of the 4 FFA related components ranked near the bottom in the ratings when compared to the other 33 components in the study (FFA proficiency awards program - 29th, state/American Farmer degree program - 30th, computers for use in managing FFA activities - 33rd) and the fourth FFA related component ranked in the bottom one-third (FFA contests - 22nd). Agricultural educators at all levels should conduct and/or support research and related activities to determine the role that FFA should play in the program.

2. State and federal supervision of programs is a moderately important factor in insuring that programs of the future will be quality programs when compared to others addressed in the study. On an individual factor basis, state supervision was ranked 28th and national supervision was ranked 29th out of the 29 factors in the scale. NASAE should evaluate their role in program improvement and quality maintenance and determine the priority that the quality of local programs should hold in the state supervision program.

3. Teacher quality is the most important factor in insuring quality programs in the future. This factor loading included the five top ranked individual factors plus one moderately ranked factor: teacher pay and benefits (#1), teacher professionalism (#2), retention of competent teachers in the profession (#3), quality of new vocational agriculture teachers (#4), leadership shown by individual vocational agriculture teachers (#5), and teacher certification requirements (#19). Teacher educators should evaluate their programs to determine if they are being as effective as possible in the pre-service and in-service education of vocational agriculture teachers.

Table 2

Importance of Selected External Factors in Insuring Quality Programs for the Year 2000 ($\underline{n}$ = 211)

Factors	Mean[a]	S.D.
Teacher quality	4.59	.38
Teacher pay and benefits	4.78	.44
Teacher professionalism	4.70	.50
Retention of competent teachers in the profession	4.68	.54
Quality of new Vo-Ag teachers	4.64	.55
Leadership shown by individual Vo-Ag teachers	4.63	.54
Job opportunities for Vo-Ag program completers	4.58	.59
Teacher certification requirements	4.18	.78
Funding	4.56	.58
State funding	4.61	.63
Local school board funding	4.58	.67
Federal funding	4.50	.78
Public image	4.42	.56
The perception of our program by others	4.63	.60
Agricultural awareness in junior high school	4.49	.64
Agricultural awareness in elementary schools	4.13	.81
Program administration	4.38	.52
Publicity about Vo-Ag programs	4.58	.61
Recruitment of students into Vo-Ag programs	4.56	.63
Local supervision of programs	4.28	.76
Local advisory councils	4.11	.91
Teacher preparation	4.19	.61
In-service programs for Vo-Ag teachers conducted by state Agriculture/Agribusiness Education staff	4.28	.78
In-service programs for Vo-Ag teachers conducted by teacher education programs in agriculture	4.22	.76
Pre-service teacher education programs in agriculture	4.15	.79
Graduate degree programs in Agricultural Education	4.11	.77
Instructional materials development	3.99	.69
Instructional materials development	4.22	.75
Development of computer software for Vo-Ag programs	4.06	.88
Computer networks (such as Ag-Ed Network)	3.72	.96
Support for SOE program	3.80	.76
Record-keeping for student awards and recognition	3.91	.84
School provided facilities for SOEPs	3.68	1.02
Instructional supervision (state, federal)	3.33	.93
State supervision of programs	3.67	.94
National supervision of programs	2.99	1.14

[a] not important = 1, slightly important = 2, moderately important = 3, very important = 4, extremely important = 5

Table 3

T-tests of Factors Derived From Factor Analysis by Contract Length

Factor	Contract Length						
	11 months or less			11.5 or 12 months			
	m	sd	n	m	sd	n	t[a]
Instructional material development	3.99	0.69	72	3.99	0.69	133	0.03
Funding	4.66	0.51	73	4.50	0.61	135	1.93
Teacher preparation	4.20	0.59	73	4.17	0.63	134	0.26
Teacher quality	4.59	0.35	72	4.60	0.39	134	-0.05
State and national supervision	3.34	0.93	73	3.31	0.93	135	0.15
Public image	4.44	0.55	73	4.41	0.54	134	0.38
Program administration	4.42	0.46	73	4.37	0.54	133	0.70
Support for SOE program	3.74	0.78	72	3.81	0.75	135	-0.58

[a] Using pooled variance estimate

Table 4

T-tests of Factors Derived From Factor Analysis by Number of Teachers in Department

Factor	Number of teachers in department						
	1 teacher			2 or more teachers			
	m	sd	n	m	sd	n	t[a]
Instructional materials development	3.96	0.68	137	4.06	0.73	71	-0.94
Funding	4.53	0.57	139	4.63	0.58	72	-1.31
Teacher preparation	4.16	0.61	138	4.24	0.62	72	-0.96
Teacher quality	4.56	0.38	137	4.66	0.38	72	-1.75
State and national supervision	3.29	0.82	139	3.41	1.11	72	-0.88
Public image	4.40	0.53	138	4.44	0.62	72	-0.45
Program administration	4.36	0.48	138	4.44	0.58	71	-1.05
Support for SOE program	3.85	0.72	138	3.70	0.83	72	1.33

[a] Using pooled variance estimate

Table 5

T-tests of Factors Derived From Factor Analysis by Community Size (Population)

Factor	Community population: Less than 5000 *m*	*sd*	*n*	5000 or more *m*	*sd*	*n*	*t*[a]
Instructional materials development	4.00	0.70	136	4.00	0.66	69	-0.07
Funding	4.49	0.62	137	4.69	0.47	71	-2.49
Teacher preparation	4.14	0.60	137	4.26	0.63	70	-1.40
Teacher quality	4.59	0.38	136	4.62	0.36	70	-0.66
State and national supervision	3.31	0.93	137	3.34	0.92	71	-0.21
Public image	4.40	0.54	137	4.47	0.54	70	-0.91
Program administration	4.39	0.51	137	4.39	0.52	69	-0.13
Support for SOE program	3.78	0.74	136	3.83	0.81	71	-0.50

[a] Using pooled variance estimate

4. Funding is the second most important factor in insuring quality programs in the future. This factor loading included three individual factors: state funding (#7), local school board funding (#10), and federal funding (#12). State supervisors and teacher educators should work together to assist teachers in taking advantage of all funding opportunities that are available to local vocational agriculture programs.

5. Teachers opinions of the factors that are important in insuring quality programs in the future do not differ according to contract length, community size and number of teachers in the department.

6. This study was conducted to determine vocational agriculture teachers' opinions of selected program components and factors in insuring quality programs for the future. Additional research should be conducted to secure the opinions of teacher educators, state supervisors, school administrators and others with knowledge of and an interest in the future of vocational agriculture programs so that a consensus may be reached as to how quality programs should be designed and maintained.

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Vocational Agriculture For The Year 2000
A Critique

Alfred J. Mannebach, University of Connecticut -- Discussant

The authors have aspired to an awesome task in attempting to determine the future of vocational agriculture in the year 2000. Although only a short 14 years away, their efforts to conduct "future oriented" research is commendable. That the study was national in scope makes the results even more important.

The specific strengths of the paper were: (1) A good statement of need and rationale for conducting the research was presented. (2) Persons closest to the operation of the vocational agriculture program, namely, the teachers, were surveyed. (3) Relevant purposes of the study were identified and studied. (4) A formula was used to determine the recommended sample size. (5) Data were presented in a concise, clear manner. (6) Tables summarizing all data collected were presented.

Some weaknesses or questions about the research include: (1) There appeared to be no rationale for the inclusion of the three demographic variables studied. (2) Why was a "closed form" questionnaire used in a "what could or should be" study? Although easier to quantify, the results lack the creativity and individualized thinking of a more open ended survey. (3) Although a return rate of 84.4% was obtained, perhaps the researchers should have considered over sampling to obtain the recommended sample size. (4) In a study such as this, some mean ratings are the lowest. That does not mean that they are not important, they may have a lower priority. Specific reference regarding this point is found in point one under conclusions and recommendations. As shown by the data in Table 1, no component received a mean rating less than 3.05, moderately important. Although FAA components included were rated relatively low, leadership instruction received the highest rating. Also, some of the FFA programs rated may be "outcomes" rather than "components." This point raises issues regarding the validity of the intrument used.

In summary, the authors presented an informed rating of the importance of selected components and the identification of relevant external factors needed in quality programs in the future. The external factors identified by the teachers are real. They must obtain our time, attention and resources if the program of vocational agriculture is to be viable in the future.